ARCHITECTURAL RECORD

JUL 15 1940

NEWS TRENDS BUILDING TYPES (HOTELS)

In addition to consuming 6,000 lbs. of Anaconda Through-Wall Flashing, this new City Hall in Elizabeth, N. J., uses 31,000 lbs. of Anaconda Copper for its batten seam roof. Architect: A. A. Kaufman, Elizabeth, N. J. Sheet Metal Contractor: Avon Sheet Metal Works, Newark, N. J.

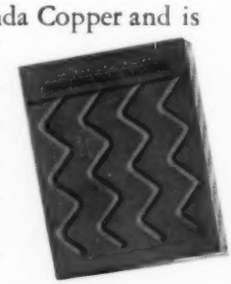
HOW TO CONTROL DRAINAGE IN MASONRY WALLS!

Use of Anaconda Through-Wall Flashing prevents interior damage due to seepage and helps to avoid salt deposit streaking

Because seepage is common in masonry walls, adequate drainage must be provided to prevent streaking of outside walls and damage to interiors.

Anaconda Through-Wall Flashing offers the easiest, least expensive and most positive method of drainage control. So designed as to drain itself dry on a level bed, this copper flashing also prevents lateral movement in any direction.

It is constructed of 16 oz. Anaconda Copper and is available in 8′ lengths in a range of standard and special widths with various selvages. More about these and other interesting details is contained in Bulletin C-28. Ask for a copy. 4035



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Fully illustrated 12-page folder on Anaconda Through-Wall Flashing . . . Bulletin C-28.

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THE AMERICAN BRASS COMPANY, General Offices: Waterbury, Conn.

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Architect.

ARCHITECTURAL RECORD

COMBINED WITH AMERICAN ARCHITECT AND ARCHITECTURE

VOLUME 88 JULY 1940 NUMBER 1

IN THE RECORD NEXT MONTH

AUGUST, apex of the exposition season, will feature another article by Douglas Haskell on the 1940 New York Fair—an illustrated commentary on design angles evinced thereat, really a "critical survey" of new types of buildings and significant design solutions which are wide in their applicability to building problems of various and widely distributed kinds.

Among the new buildings will be the Saks' Fifth Avenue branch store at Miami Beach, Fla.—a study in single-story design suavity which could well be at home in any part of the country. Also, as another example of a particular solution for a particular clime, with an implicit cosmopolitan adaptability, August will offer the Stanislaus County Office Building in Modesto, Calif.—compactly planned and executed in concrete, with extraordinarily large window areas.

New houses will depart moderately from precedent. Instead of being tied to any category of common design limitations, they will be simply the best new houses that have come along—a varied assortment of types, culled from the country at large, showing a variety of treatments for a variety of problems. Their chief communality will be in timeliness and general interest.

And Building Types, if we can believe (and we do) our legion reader appeals, comes along, like a Presidentially campaigning Mr. Right, with a study on *Apartments*. Included will be a detailed, illustrated survey of advances in apartment-house design, Time-Saver Standards, and Case Studies. In addition, we are planning an analysis of the unit cost of design and construction of a typical apartment house—to indicate what cost proportions may most profitably be allocated to lobby, corridor, and concierge; parlor, bedroom, and sink.

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Built by an architect, for an architect

. . . WITH STUCCO

● James Lawrence, Jr., of Brookline, Mass., Architect, frames his own home in attractive, protective covering of Portland Cement Stucco, made with Atlas White cement. Stucco contractor, Lowell-Whipple, Worcester, Mass. Stucco manufacturer, California Stucco Products Co., Inc., Cambridge, Mass.

IN Brookline, Mass., an architect planned to build his own home. Said the architect to himself as client: "I recommend a portland cement stucco finish for your classic-modern house."

Said the client to himself as architect: "It's O. K. with me. Go ahead." And so white portland cement stucco over cinder block supplied the exterior and enhanced the design of the house above, including all the fine detail and recessed trim.

Whether for themselves or their clients—for homes or business structures—architects are demonstrating today the versatility, beauty, durability and low upkeep of this overcoating of steel and concrete made with Atlas White portland cement. Portland cement made with Atlas White stucco blends well with different types of architecture and with other materials—wood, stone and brick. It is a most attractive finish by itself. It's easily tinted to a wide range of colors. It retains its original fresh appearance for many years. It's fire-safe and weather-resistant. Its first cost is moderate. Its upkeep amounts to practically nothing.

Consider the appearance and cos advantages of stucco, made with Atlas White cement, in connection with your next job. Think of it for new work or modernization. Universal Atlas Cement Co. (United States Steel Corporation Subsidiary), Chrysler Building, New York City.

A FACTORY-MADE STUCCO IS PREFERABLE

AR-S-18

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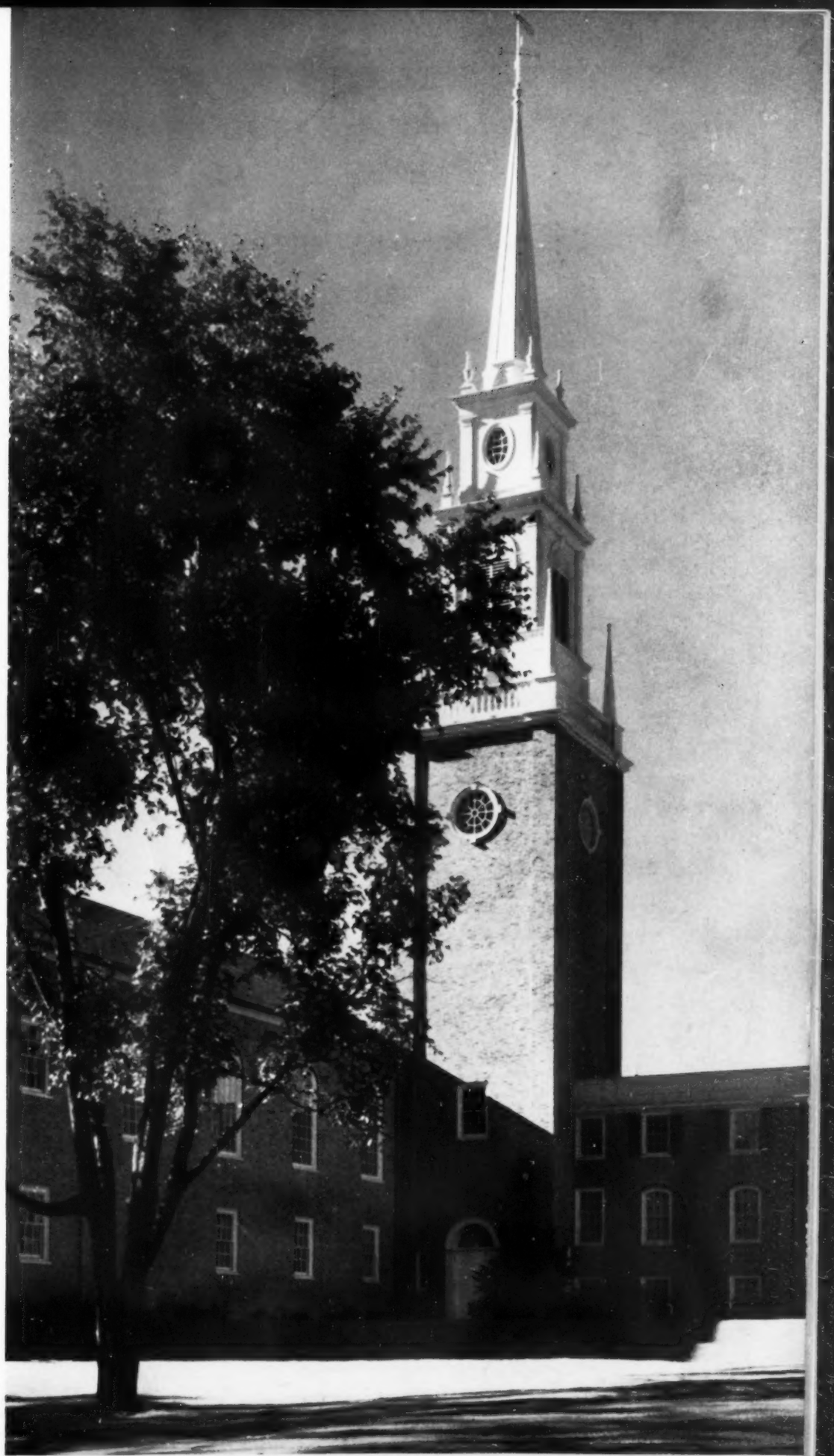
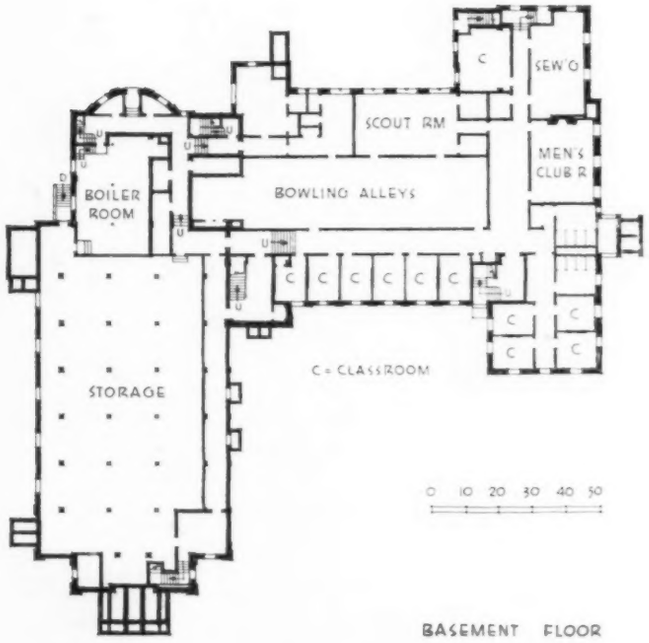


Paul J. Weber

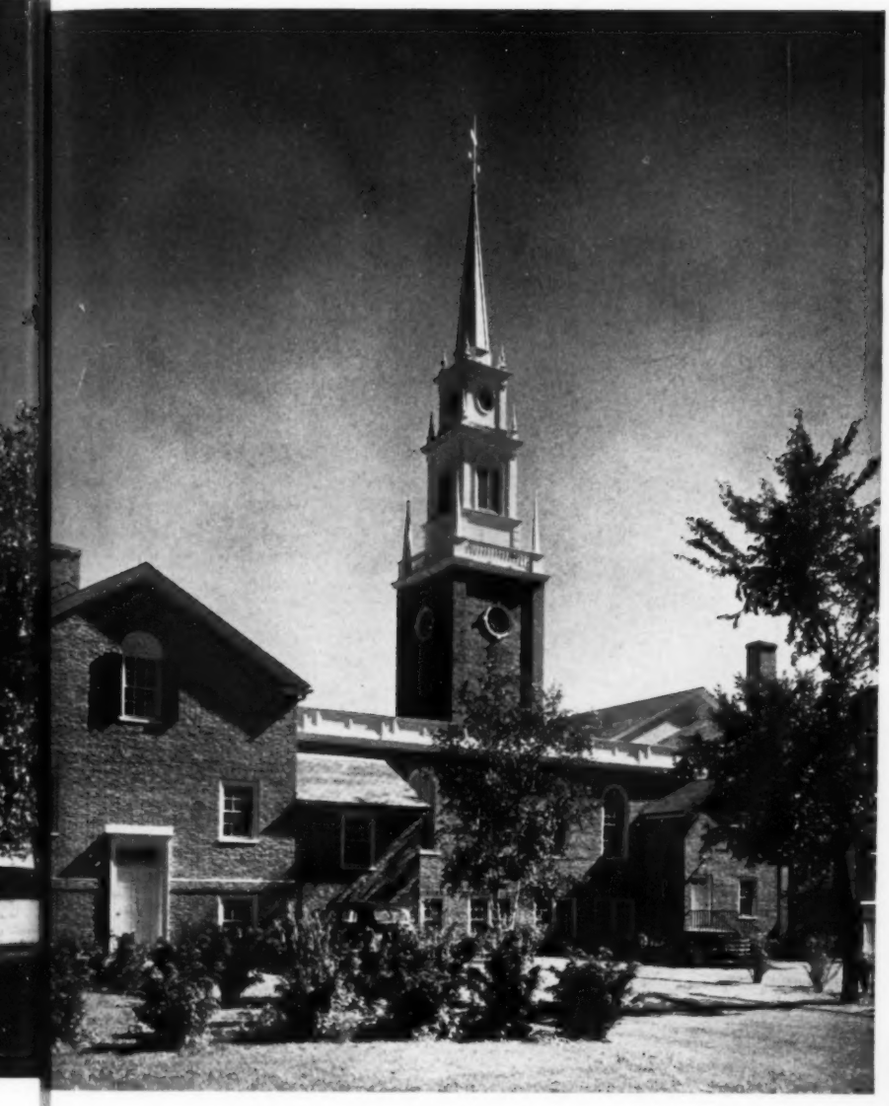
NEWS

Photos by Paul J. Weber



BASEMENT FLOOR

FIRST FLOOR



NEW CHURCH PROVIDES MULTI-USE FACILITIES

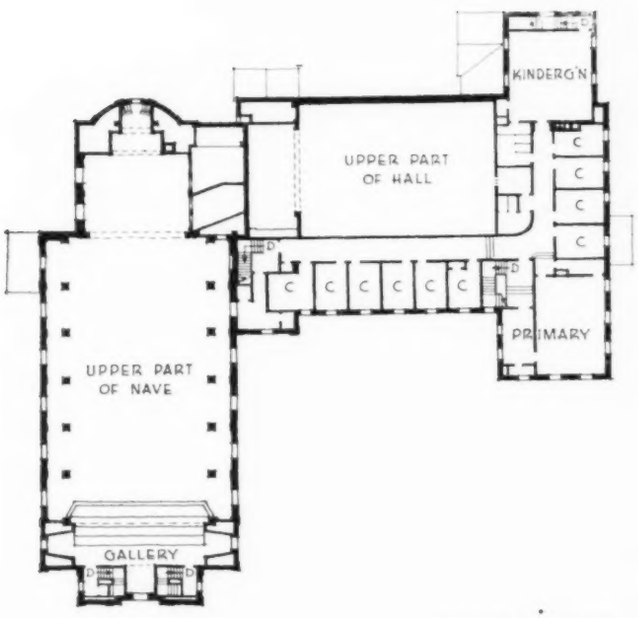
In 1937, the First Baptist Church of Worcester, Mass., was destroyed by fire. Today the church has an extensive new Colonial home, shown on these pages. Architects were ALLEN, COLLENS & WILLIS.

THE PLAN of the new structure follows a growing trend toward providing areas and equipment for social and recreational facilities as well as those identified solely with the religious needs of a house of worship.

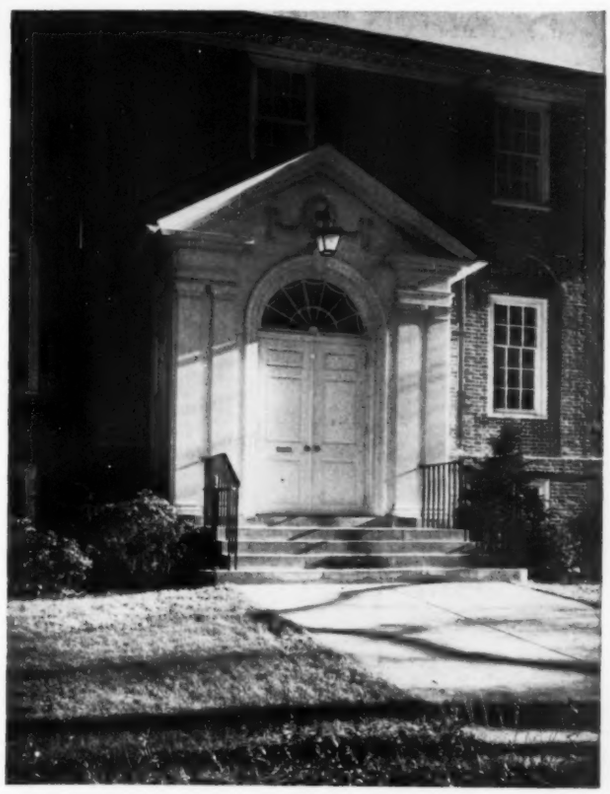
The plan consists of five main subdivisions—the church proper, the assembly hall and stage, a chapel and church offices, classrooms for five grades of Sunday School, and the various social and club rooms and their appurtenances.

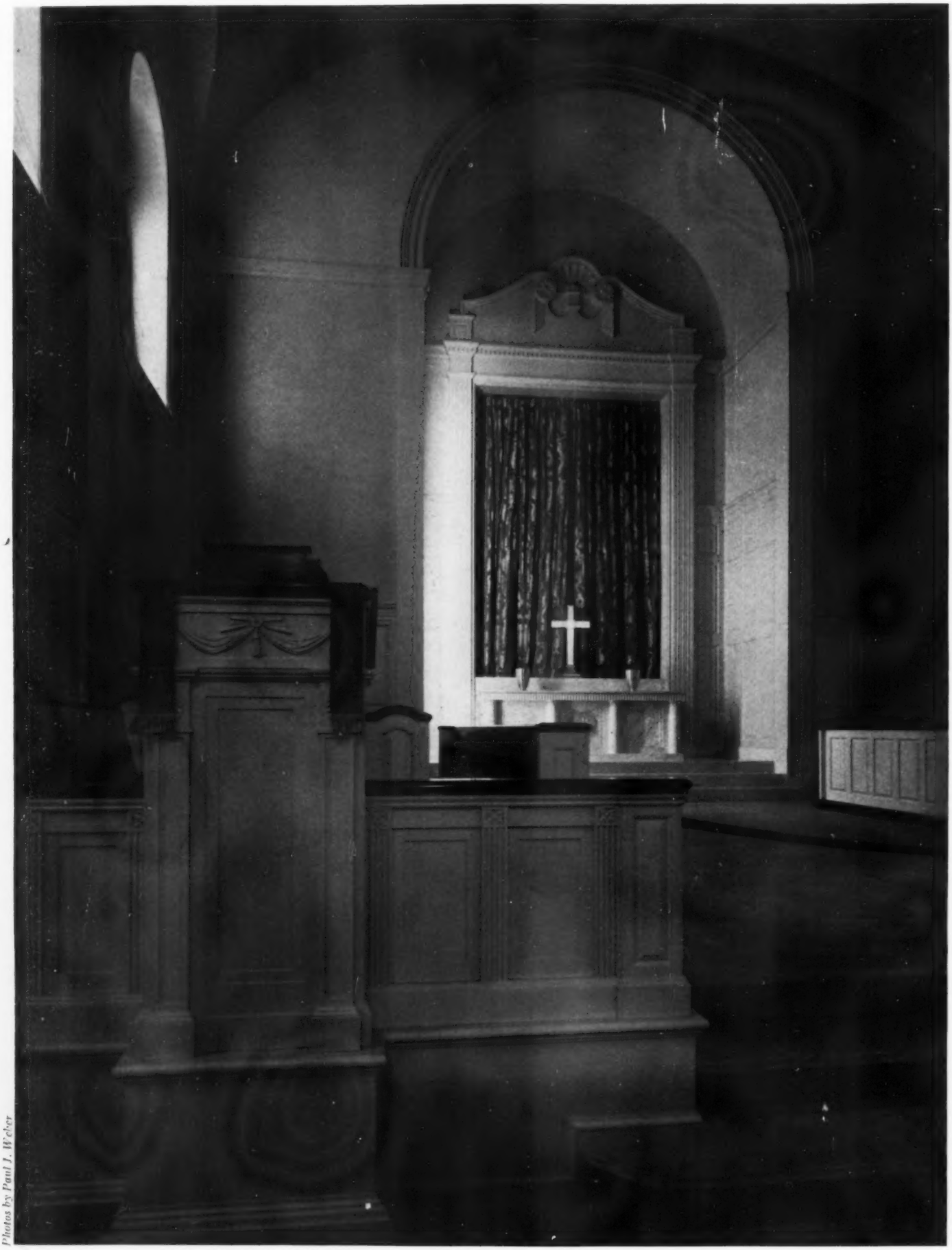
By organizing the plan elements in an L-shape layout and by placing the structure with the tower at the interior corner, the architects have made notable use of a handsome corner lot. Entrances to the various portions of the building are so located that any one may be used independently of the others.

In the basement, beneath the social hall, are the bowling alleys. Also at this level are the boiler room, meeting rooms, and 10 of the Sunday School classrooms. The second floor contains other classrooms, moving-picture projection room for the assembly hall, and a broadcasting room.



SECOND FLOOR





Photos by Paul J. Weber

BAPTIST CHURCH. Worcester, Mass.

ALLEN, COLLENS & WILLIS, Architects

CONSTRUCTION consists of steel and concrete columns, steel girder and wood joists in the parish house, and a concrete floor under the nave and chancel. The roof over the church is made up of steel trusses, with wood rafters.

Since the former church was destroyed by fire, effort was made to make the new building as fireproof as the structural system allowed. The building is furnished with a sprinkler system, worked out with the fire underwriters.

To keep costs down, standard materials have been used throughout. Linoleum covers the floors of classrooms and halls. Rubber tile is used in the Davis Chapel and entrance hall. In the assembly hall (where dances and other group activities occur) and reception room, wood forms the flooring, while the kitchen floor is of mastic. In the church proper, linoleum is used under the pews, with the aisles and chancel surfaced in marble.

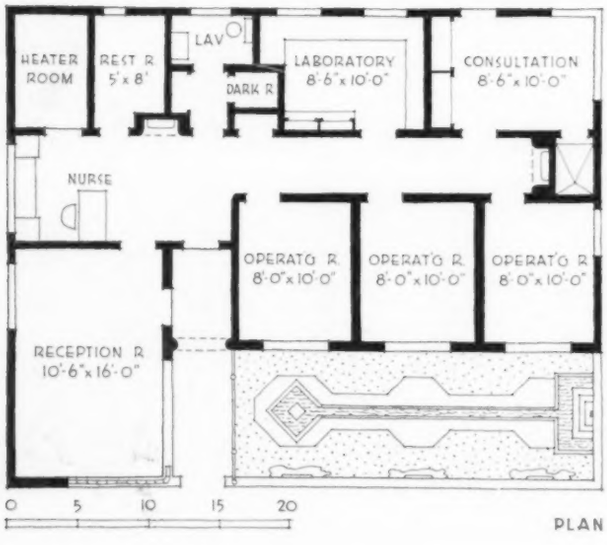
Acoustical plaster, tinted before application, is used in all the larger areas of the building. The bowling alleys are sound-insulated with insulation board.

Although not air-condtioned, the building is heated by a vapor system. In the church auditorium, the air is brought up through the window sills and recirculated.

Above, a general view of the church nave. At right, from top to bottom: Davis Chapel, Gordon Assembly Hall, Whitney Reception Room, and the spacious kitchen.

DENTAL OFFICE HAS UNIQUE FENESTRATION

In designing the Earle M. Young Dental Office Building in San Rafael, Calif., Architect J. CLARENCE FELCIANO carefully considered the needs of both patients and dentists. The plan offers access to rooms with a minimum of cross traffic. Skylight windows flood the operating rooms with desirable north light.

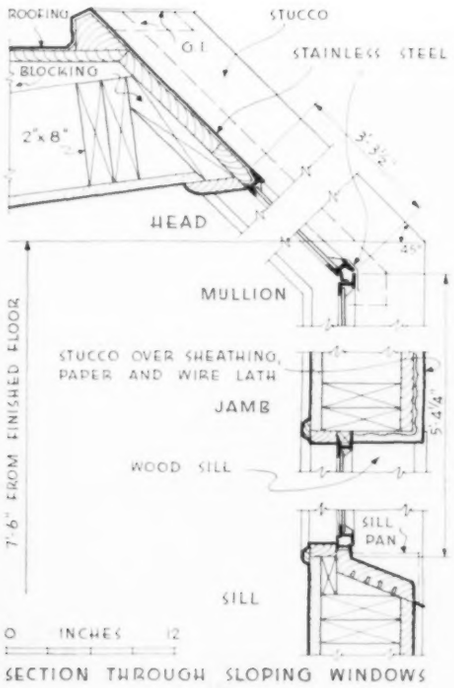


PLAN

A SOUTHEAST CORNER LOT suggested the basic layout of the building. By recessing the row of operating rooms, two advantages were gained: the reception room, though shielded from the street by a glass-block panel, looks out at the side onto a pleasant walled garden with fountain and pool; the operating rooms are set back from the gaze of passers-by.

The placement of the entry between reception room and operating rooms enables patients to leave the building without re-entering the reception room. In the central corridor are two recessed alcoves, equipped with plate-glass shelves and mirrors, with flush lights overhead. These are for the use of patients for tidying up.

Construction of the building throughout is of wood frame, with a concrete foundation, plaster exterior surface, and composition roof. Sash are of steel. The operating rooms have painted, smooth-plastered walls and ceilings.



SECTION THROUGH SLOPING WINDOWS

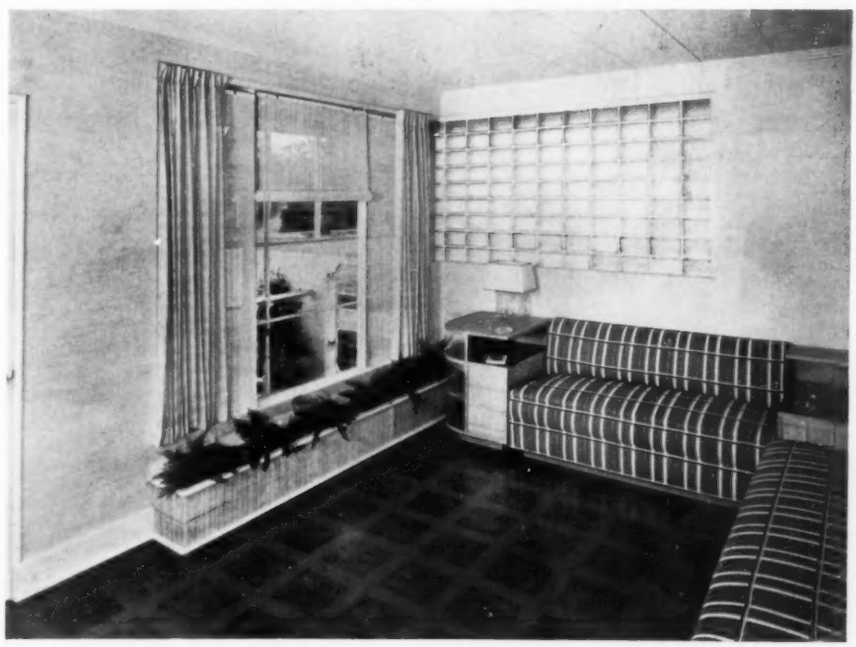
Operating rooms are flooded with light from the big windows in the north wall.

Floors are of linoleum with cove base. The partitions between operating rooms are soundproofed so that each of the rooms is noise-isolated from the others.

Grass cloth covers the walls of the reception room. The ceiling is of insulation board; the floor, linoleum. In the rear consultation room, walls are of wood veneer, and insulation board is used on the ceiling. An all-over carpet covers the floor.

All laboratory counters and cabinets were specially designed for the dentists' special needs. These were worked out in collaboration with Rollin F. Kelso. Counter tops are of hard-pressed board, finished with chromium moldings. At the gold bench, to the right of the laboratory door, fluorescent lighting is used.

The building is heated by an oil-burning forced-air furnace located on the ground floor level. The system is thermostatically controlled.


In the reception room, the side window affords a view of the private garden.

No. 1: From a station entrance, the door leads into

No. 2: the carpeted foyer. Walls, white-oak veneer on flexible backing

Photos by Hedrich-Blessing

No. 3: The Crossroads Room. Walls, white-oak veneer; furniture, white oak and imitation leather; reddish-brown carpet

No. 4: Mural, by Edgar Miller, illustrates old Chicago and Fort Dearborn.

No. 5: The chromium fixtures hang from anemostats.

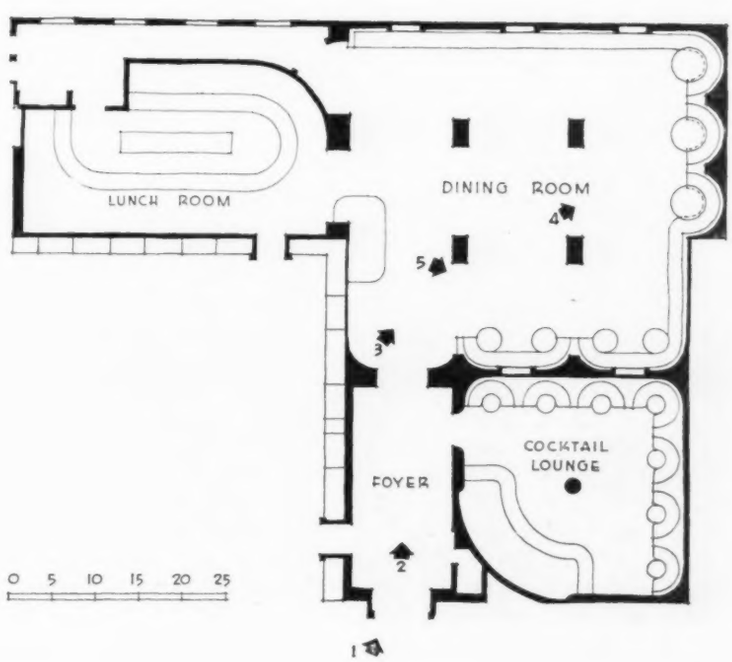
OLD CHICAGO STATION GETS NEW RESTAURANT

The design problem in the new Fred Harvey Crossroads Restaurant in Chicago's Dearborn Station was to provide for the needs of both hurried travelers and patrons from near-by Loop District office buildings. In the plan, by Architect SAMUEL A. MARX, therefore, facilities range from a counter lunchroom to a rather luxurious dining room and bar.

FOR A NUMBER of years, the Fred Harvey organization has maintained a modest lunch counter and restaurant in the Dearborn Station in Chicago. But to serve the buildings in the district as well as the increased West Coast traffic of the Santa Fe lines, it was decided to enlarge the facilities and to build a first-class restaurant. The result is the Fred Harvey Crossroads Restaurant, shown on these and the two following pages.

The layout consists of a lobby off one of the station entrances, a restaurant called the "Crossroads Room", seating 102, a cocktail lounge and bar, serving 50, and a lunchroom with room for 31 persons.

The light-oak walls of both the entrance lobby and The Crossroads Room are finished in light brown. Ceilings are of acoustical plaster (except for the smooth-plaster reflector domes above the ceiling lights). All furniture was specially designed by the architect. In the lobby, the leather-like upholstery is a brilliant green; in the Crossroads Room, pigskin color. Carpeting is reddish brown with an all-over pattern.



Photos by Hedrich Blessing

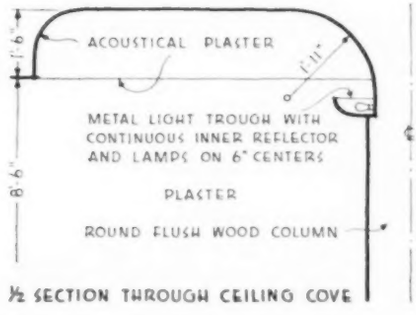
No. 6: The cocktail lounge. Early Chicago settlers, by Muralist Edgar Miller, decorate the India-red painted plaster walls

CHICAGO RESTAURANT

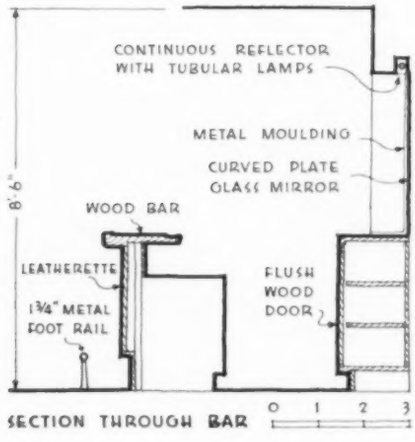
SAMUEL A. MARX, Architect

THE COCKTAIL LOUNGE occupies the area immediately adjacent to the main entrance. Covering the floor is the same reddish-brown carpeting used in the lobby and Crossroads Room. The semicircular booths, bar front, and chairs, all in imitation leather, are, like the painted plaster walls, a strong Indian red. The central column and bar top and base are black. In the ceiling, of off-white acoustical plaster, is a large ceiling cove (see detail at right, above). This serves as a reflector for the light source, concealed in a satin-finish chromium trough around the central column. There is also lighting in the recessed circular wall display cases and in the soffit above the mirrored back bar (see detail at right, below).

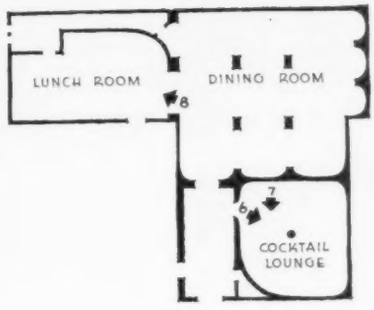
In the lunchroom, seats for 31 surround the serving counter. The floor and base are black terrazzo with white metal dividing strips. Walls are of painted plaster, with deep chocolate brown dado and upper walls of grayed lemon yellow. Walls of the corner pantry unit and the entire passage to the kitchen match the dado.



½ SECTION THROUGH CEILING COVE



SECTION THROUGH BAR



No. 7: Bar upholstered in red imitation leather; furniture designed by the architect

No. 8: Lunchroom. Decorations, by Edgar Miller, include Indian and Road Runner bird motifs.

Joseph W. Molitor

GARAGE HAS 2-IN. CONCRETE WALLS

The unique Star Parking Plaza in Washington, D. C., was designed by Architects PORTER & LOCKIE. A particularly noteworthy feature of the building is the 2-in. reinforced concrete surface diaphragm, made up of large slabs which were worked out and manufactured by John J. Earley.

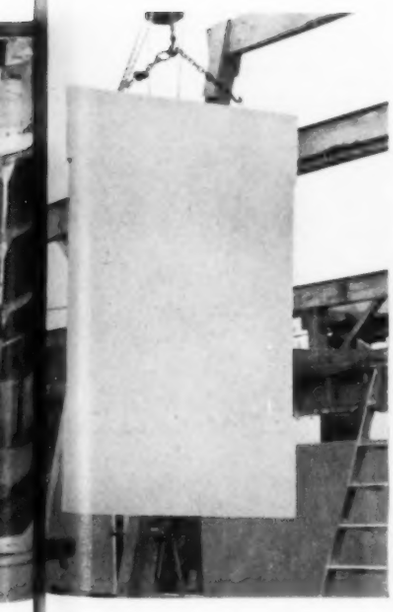
EXCLUDING the corner store and the basement, the new structure has parking facilities for 350 cars. This includes use of the entire roof area. The basement is used for vehicles of the Evening Star Newspaper Co., owners of the building.

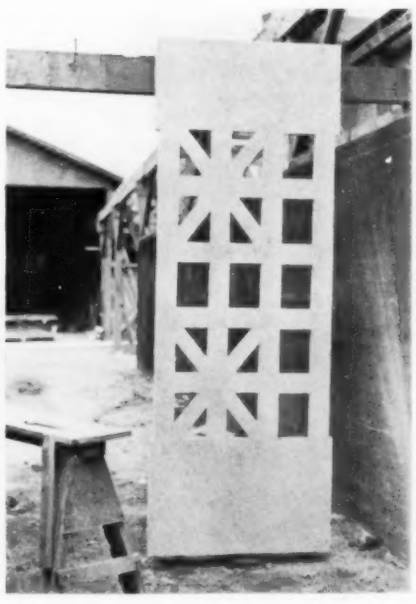
A patented staggered floor system with low-incline ramps, banked at the turns, produces five floor levels at one end of the building and four at the other. Cars are parked and delivered by attendants who reach the various levels on an endless-belt lift.

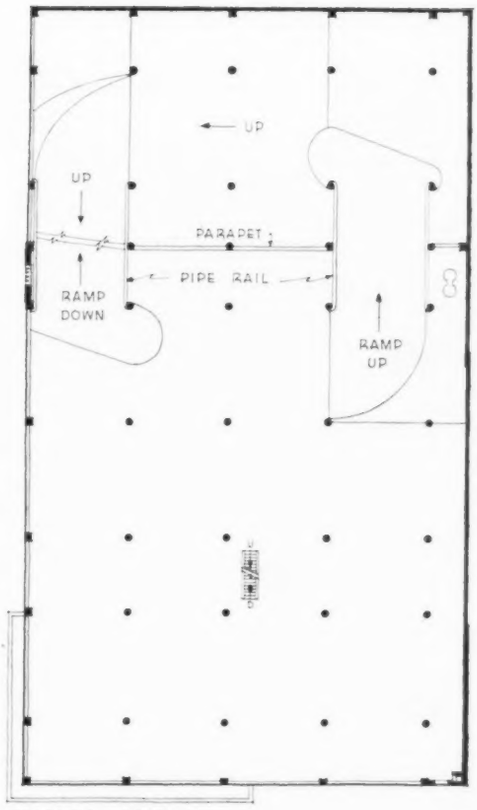
Most interesting is the structural system employed (for a construction diagram, see next page). The skeleton is of two-way reinforced concrete slab construction. Exterior surfacing is made up of slabs 3½ by 9½ ft. by 2 in., hung from the floor slabs. Each of the thin panels is formed around a steel-wire mesh which, together with the thinness, serves to localize and reduce stresses. This, in turn, serves to prevent cracking. And the size of the slabs both saves construction time and reduces the number of joints

In place of windows, certain of the slabs are perforated. In assembly, these form decorative pierced screens which supply light and ventilation. At intervals, openings are left, which correspond to parking aisles inside, allowing direct access for firemen

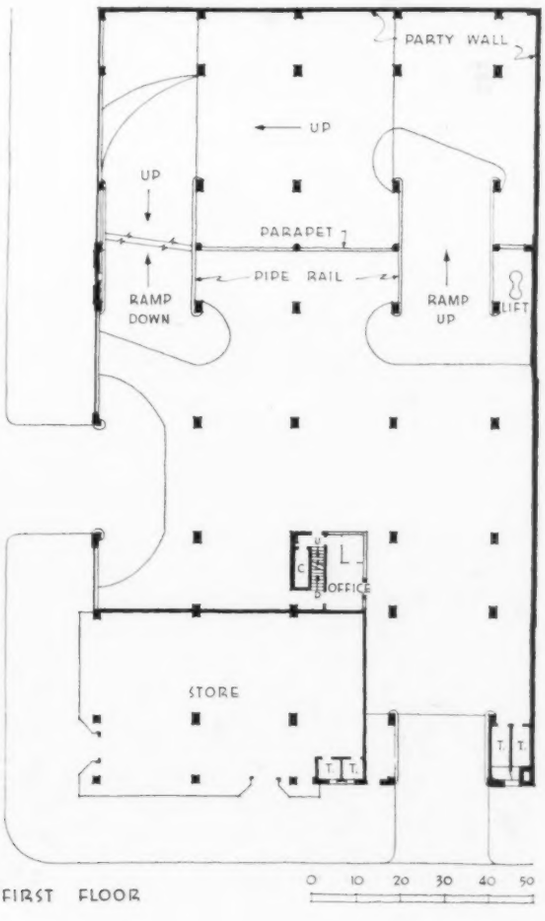
According to Mr. Earley, the thin slabs were first developed for purely structural uses, such as a thin roof to cover a large area. The Star Parking Plaza, he says, is the first instance in this country where this type of thin diaphragm has been used extensively for purely surfacing and decorative purposes.





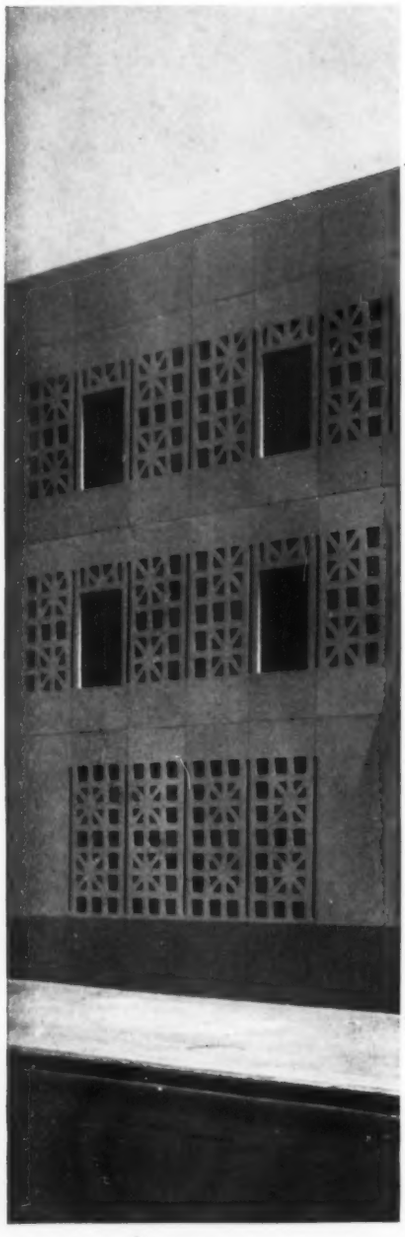


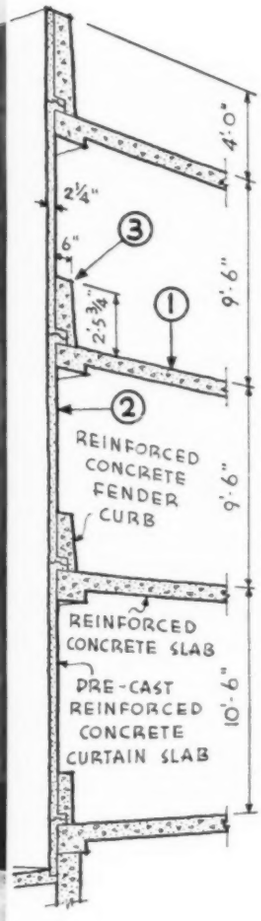
SECOND FLOOR



FIRST FLOOR

PORTER & LOCKIE, Architects

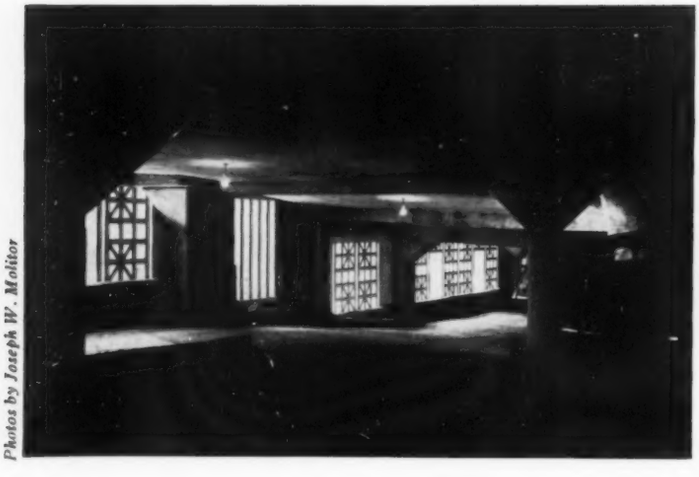




THE CONSTRUCTION SYSTEM, as delineated at left, consists of three major parts—the frame and floor slabs of reinforced concrete; the thin curtain wall of precast slabs; and the low interior reinforced concrete fender walls that act as a stop or bumper for parked cars. At the roof level, this becomes a 4-ft. parapet.

The order in which these elements are assembled follows the numbering on the diagram. The 2-in. surface diaphragm is hung on the floor slabs before the fender walls are built. Construction of the latter, in fact, makes use of the thin slab wall as one side of the form in which they are poured. These low curb walls are tied into reinforcing steel extending up from the floor slab.

Various considerations determined the use of this structural system. The basic need was for space for parking approximately 350 cars. Simplest would have been a completely open structure with fender walls. The character of the neighborhood, however, demanded something more in keeping. Cost of a totally enclosed structure was prohibitive. Thus, Mr. Earley suggested the use of his processed mosaic slabs, as they eliminated the need for windows, involved negligible extra structural expense to support them, and left the floors sufficiently open so that many costly equipment items for fire protection and the like were unnecessary.



Photos by Joseph W. Molitor

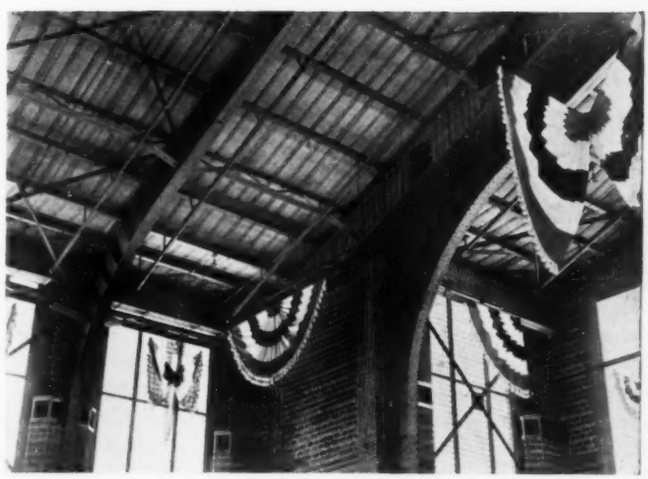
RIGID ARCH FRAME SPANS 250-FT. ARENA

Designed for quick conversion from an ice rink to a livestock pavilion to a convention hall, the Indianapolis Coliseum is the work of Architects RUSS and HARRISON. To provide an unobstructed span of 250 ft., a stiff-frame type of steel construction was used. Total present seating capacity is 13,000.

Cordell

INTERIOR SEATING is supported by reinforced concrete balconies, under which is an encircling corridor, bordered by wash rooms, concessions, exits, etc. On the mezzanine are 13 committee rooms for convention use.

The rigid frame consists of plate girders and columns in the form of arches instead of the truss type. All masonry and brickwork were carried off the spandrel and carried to the line of the steel and not to a plumb bob. The roof, of precast concrete slabs lined with 1 in. of acoustical cork, was placed before the masonry work was completed. Thus, the 1¼-in. camber at the haunches and the 4 in. at the ridge were allowed to get their set before the masonry made a direct connection with the foundation work. Each spandrel was cut off by itself by expansion joints to allow this frame expansion and contraction. The envelope of the building was also entirely cut free by a 2-in. expansion joint with the reinforced concrete seats. After the load was applied, the architects tell us, "the structure had come to within ⅛ in. of the plumb."



Cordell

Windows are of glass block. Cork-lined precast concrete roof slabs are painted light green; steel work, silver gray; brickwork is unpainted. Seats are red, yellow, and blue.

WHAT'S NEW IN MATERIALS AND EQUIPMENT

Courtesy "The Austin Co."

Atop a new addition to the John Swisher & Son Co. plant in Jacksonville, Fla., the children of women employees frisk about in the sun, or play in the adjacent room (8,500 feet square) while their mothers are working. The open-air playground (12,000 feet square) is surfaced with Traffic-Top, a specially treated, bitumen-impregnated, resilient insulation board, product of the Celotex Co. The roof-top nursery has been in operation for the past six months, with a pediatrician in charge of its staff; admittance applications exceed capacity.

Glass-Block Roofs

"ALGLAS" ALUMINUM FRAMES are designed for use with "Vacu-Lite" glass blocks in constructing ceilings, skylights, and roof. The glass blocks are said to fit easily into the interlocking aluminum panels, thus providing a decorative interior effect while eliminating the use of concrete or the necessity of expensive ceiling sash. The construction is said to offer high thermal resistance to outside weather. The American Bar Lock Co., Inc., Long Island City, N. Y.

New Floor Finish

"BAKEFLEX" is a floor finish with a "Bakelite" base which can be used on old and new floors. It is said to penetrate the wood and protect it against cigarette burns, alcohol, oil, dilute acids, etc. The finish may also be used on linoleum, asphalt and rubber-tile floors, terrazzo, etc. Flexrock Company, 2300 Manning St., Philadelphia, Pa.

Glassware for Fluorescent Lights

"GLASS WAFFLES" are pressed-glass panels designed specifically for use with fluorescent lighting. They are made in sizes as large as 24 by 48 in., and two patterns are available: a prismatic lens designed for down lighting, and a decorative pattern to give diffusion. Correct light diffusion, or direction, is secured by elaboration on the back of the panel, which makes it easier to keep clean. Macbeth-Evans Division, Corning Glass Works, Charleroi, Pa.

Two Electrical Outlets

TWO NEW electrical outlets, one designed for use with electric wall clocks and the other for outdoor use in all weather, have been announced. The clock outlet provides both mechanical support and electrical connection for the clocks, thus eliminating the necessity of a visible extension cord. The weatherproof outlet has been designed for use in damp locations. It includes a cadmium-finished aluminum-lacquered plate, a rubber mat for use under the plate to keep out moisture, and a rubber cover. General Electric Company, Bridgeport, Conn.

Double-End Outlet Boxes

A NEW DOUBLE-END outlet box has been designed to simplify the installation of switches and outlets in the thin wall partitions found in some modern hotels, apartment houses, etc. It permits the installation of two switches or outlets beside each other but facing in opposite directions, thus supplying two rooms from a single run of conduit or cable. General Electric Co., Bridgeport, Conn.

Inexpensive Hot-Water Heating Systems

A HOT-WATER heating system complete with convector-type radiators and water circulator is said to be priced for homes whose final cost is as little as $3,500. Other features are a boiler designed to save space and a circulation system which requires only one pipe to each convector instead of the customary two. The Trane Company, La Crosse, Wis.

Automatic Coal Stoker

AN AUTOMATIC-FEED coal stoker has been announced as an addition to the "Round Oak" line of warm-air furnaces and air-conditioning equipment. Its features include a crusher block that breaks large lumps of coal, thermostatic controls especially designed for stokers, and an automatic air-pressure damper. Described as suited for steam and hot-water boilers as well as warm-air furnaces, it is available in six sizes ranging in coal fed per hour from 10 to 150 lbs. Round Oak Company, Dowagiac, Mich.

New Soldering Method

REACTION SOLDERING is described as an effective, fast method of joining metals that eliminates iron tinning, fluxing, and the conventional solder bar. It is simply applied to the joint (in powder or paste form) and then subjected to relatively low heat by torch, flame, oven, soldering iron, electrical resistance, or any other desired method. The manufacturer also claims that the use of reaction solder is not restricted to one group of metals, but works well with all ferrous and nonferrous metals. Colonial Alloys Company, Chemical Division, Colonial Philadelphia Building, Philadelphia, Pa.

Photo Tracings from Pencil Drawings

"HECCOTEX" is described as a tracing linen that will reproduce a master positive copy from a pencil drawing. The copy is made by contact photoprinting in ordinary office light and is said to eliminate completely the necessity of making ink tracings by hand. Moreover, the linen does not shrink or stretch when immersed in the developer, and therefore makes possible true-to-scale blueprints or other types of drafting-room reproductions. Other features claimed for the product are its ability to bring out good reproductions from old, worn-out tracings, the fact that erasures and corrections can be made on the copy with any kind of ink, and the simplicity with which it may be used. In this latter respect, no lenses, focusing, or dark rooms are involved. "Heccotex" is available in rolls ranging from 12 to 36 in. as well as in sheets cut to whatever size required. Hunter Electro-Copyist, Inc., Syracuse, N. Y.

Roger Sturtevant

HOUSES WITH THREE BEDROOMS

Roger Sturtevant

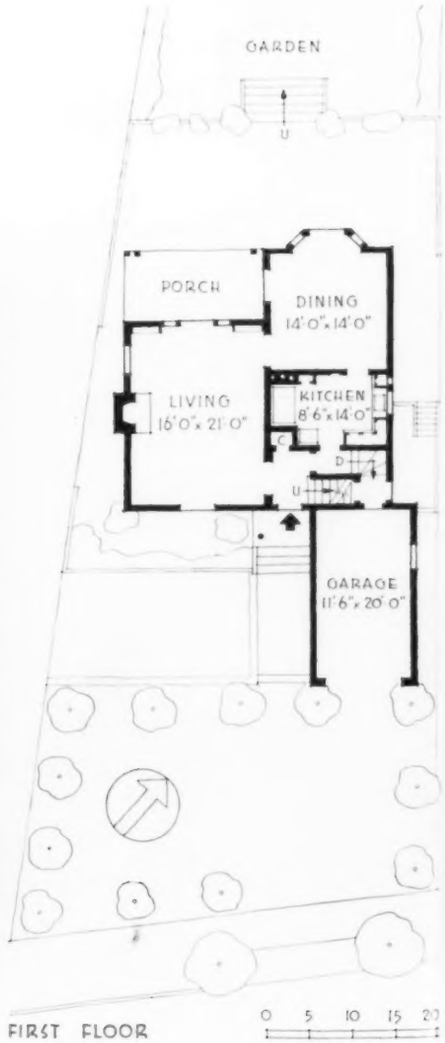
Presented herewith is a group of houses selected for their variety of solutions to a common planning problem. Some are suburban; others offer ingenious answers to the problem of a narrow lot. First in the group is this residence in San Mateo, Calif.

PROPERTY RESTRICTIONS COMPLICATE PLAN PROBLEM

In designing this house for Mr. and Mrs. Theodore Wright in San Mateo, Calif., Architect HERVEY PARKE CLARK had to contend with a narrow lot and a local building restriction requiring a 25-ft. setback from property lines. Consequently, the plot plan was as important a consideration as a compact arrangement of elements in the house plan.

BEFORE PURCHASING the property, the owners consulted Mr. Clark as to the feasibility of building on a lot that measures 50 ft. at its widest point and narrows to 37 ft. at building location. By placing the house near the rear of the lot, and treating the front garden as a single gravel court (instead of breaking it up into driveway, lawn, and walk), the architect was able to achieve an effect of spaciousness. Compactness of plan was a prime requisite. Three bedrooms were required (the family consists of Mr. and Mrs. Wright and their young son); these all have cross ventilation and are amply equipped with closets. There are two baths, convenient to, but independent of, the bedrooms. Circulation is concentrated at the stair hall: three entrances—main, service, and garage—open onto the same area on the first floor; and the upstairs hall occupies a minimum of space. Although the house as a whole is compact, the main rooms are spacious, and the living room is large enough to accommodate a grand piano. The exterior walls are finished with redwood siding, painted light gray; trim is white. Interior walls are plaster; in living room, dining room, and stair hall, the walls are painted soft gray green; bedroom walls are papered; woodwork throughout is oyster white. Cost of the house was 41.8 cents per cu. ft.

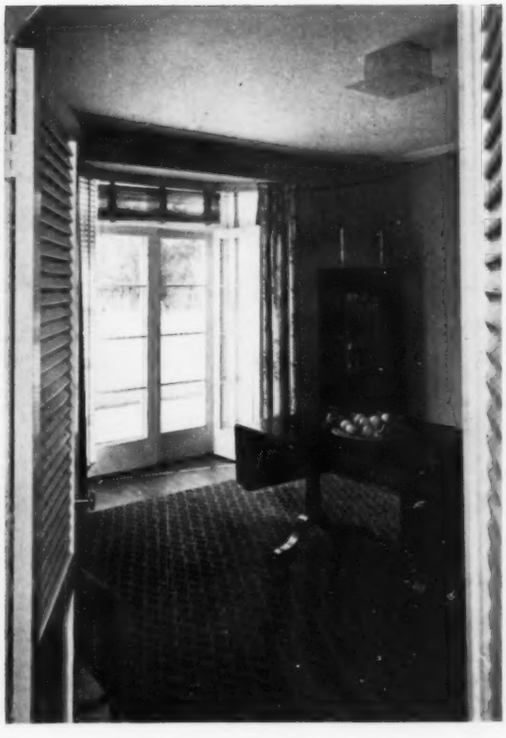
SECOND FLOOR



FIRST FLOOR

Photos by Roger Sturtevant

Rear elevation: covered terrace is accessible directly from both living and dining rooms.

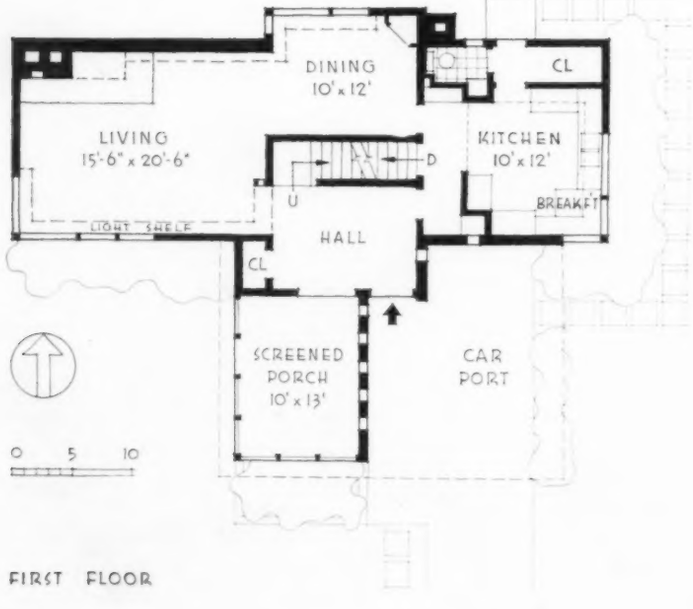


Top: front elevation showing the gravel court. Below, left: view of the living room toward rear garden; right, dining room

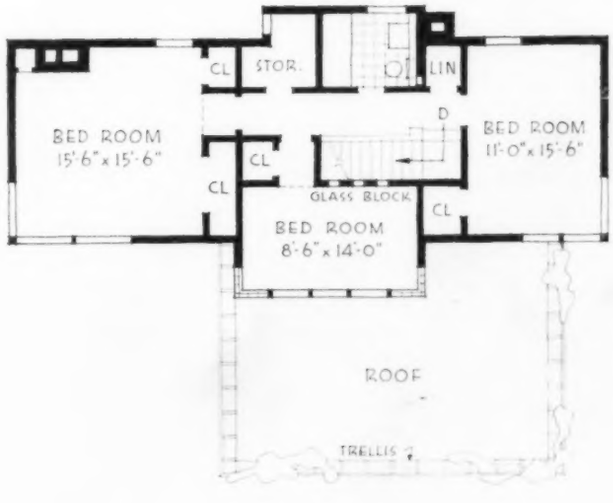
ORIENTED FOR LIGHT, AIR ON WOODED PLOT

The lot on which Mr. and Mrs. H. Richard Crane wanted to build was in a grove of trees in Ann Arbor, Mich. They had three strong desires: to avoid cutting any of the trees, to incorporate a play garden in the layout, and to orient the house so as to get as much light and air as possible. Architect GEORGE B. BRIGHAM, Jr., met all requirements by locating the house near the rear end of the lot, with a protected garden on the southwest.

Crane



FIRST FLOOR



SECOND FLOOR

AN INTERESTING part of the plan is the circulation: the stairway separates the two connecting links—dining alcove and entrance hall—between living and dining areas; upstairs, all circulation is from a central hall. Opening off the entrance hall is a living porch, built at ground level, which overlooks the garden. A brick wall on the east not only gives privacy from the entry, but acts as a protection from drafts. The owners find the doorless car port more convenient and cheaper than a garage. The exterior of the house is red brick and oiled redwood, as these colors seemed suitable for a house set among trees. For color contrast, and also to relieve the darkness of the covered entrance, the front door is painted bright yellow; trim is turquoise. These color notes are repeated on the interior: the living room uses natural redwood and brick, with turquoise at the back of the bookshelves, and accents of yellow in various furnishings. Walls are natural sand finish, lightly tinted with beige. Lighting is indirect, with lamps concealed behind a shelf. The house has an intercommunicating radio-loud-speaker system. All kitchen equipment is electric. The house cost 44 cents per cu. ft.

Crane

Garden is accessible from porch; trees and bushes protect it from street.

Elmer L. Astleford

Living room, from dining alcove; topmost shelf conceals light sources.

Ivory Photos

Opposite front door is a mirror panel, with indirect light above; massive brick chimney is feature of basement recreation room.

Photos by Ernest Graham

The side of the house is toward the road; outside stairs (above) lead to maid's room. A white picket fence marks off the front garden from which the house is entered (left). On opposite page are two interior views: left, living room; right, dining room.

DESIGNED AS SETTING FOR AMERICANA COLLECTION

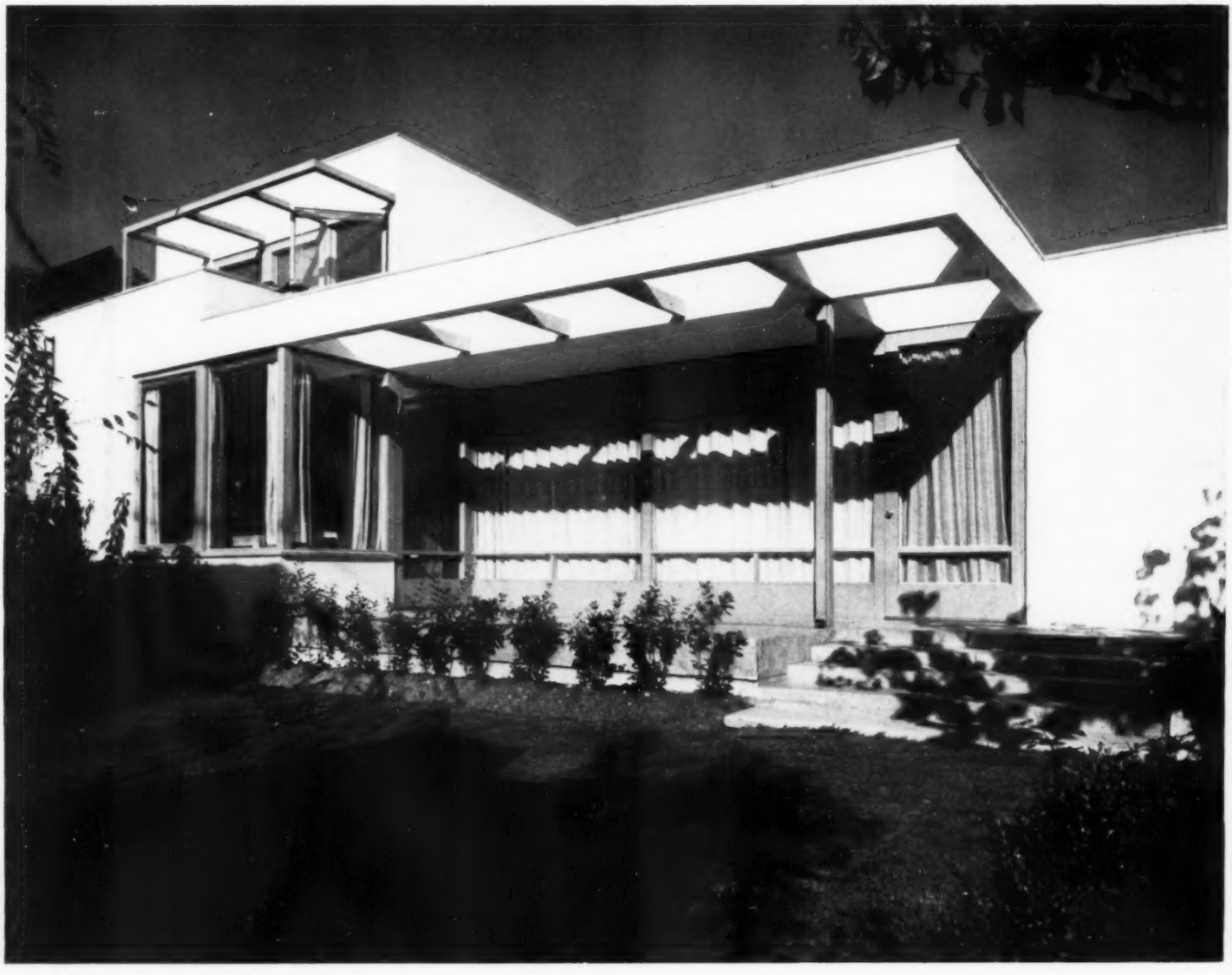
WISCHMEYER, ARRASMITH, and ELSWICK, Louisville, Ky., architects, designed this house at nearby Harrod's Creek for Mr. and Mrs. Robert F. Cate, their daughter, and Mrs. Cate's father. The design problem was to provide an interior background for Mr. Cate's collection of early American antiques; and an exterior suitable to the interior and to the environment.

SECOND FLOOR

ALTHOUGH STYLE was the principal consideration in designing this house, certain other requirements had to be met. One was that there be a bedroom and bath on the first floor; another was provision of maid's quarters quite independent of the main portion of the house. The resulting plan is interesting not only for its compactness but for the relationship of its elements. The dining room, which opens onto a covered porch, is the connection between living and service areas. An outside stairway leads to the maid's room over the garage. The house is of wood-frame construction; exterior walls are painted bone white; roof shingles are hand split, weathered to a silver-gray color. Interior trim is oyster white throughout. Walls are of plaster, painted gray green in living room and papered in hall and dining room. All floors are of random-width ash, except in bathroom and kitchen where linoleum was used. In keeping with the general character of the house are the doors of beaded battens, with hand-forged hardware modeled on antique latches and hinges. Total cost was $12,000.

FIRST FLOOR

Photos by Ernest Graham



Julius Shulman

ALL MAIN ROOMS OPEN ON PRIVATE GARDENS

Designer GREGORY AIN and VISSCHER BOYD, Associate, planned this residence for Mr. and Mrs. A. O. Beckman in Los Angeles, Calif. The requirements were challenging; the lot was narrow and deep, and all main rooms had to open on private gardens.

BY PLACING the house in the middle of the lot, even the den, which faces the street, obtains privacy; besides, this allows for a lawn in front and a secluded garden, 35 feet square, at the rear. All the rooms except the den overlook at least one patio; the living room has a western exposure but its secondary outlook is toward the children's garden. This garden, for the two little girls in the family, is a feature of the plan, for it is quite private and protected on all sides. Each child has her own bedroom opening onto the garden. The house is framed with wood posts, notched to receive continuous lintels. Exterior is white stucco, with gray-blue trim. The interior finish is painted cement plaster in most rooms; three-ply white-pine paneling is used on two walls of the living room.

Julius Shulman

Children's garden, looking toward porch and bedrooms

Julius Shulman

Street elevation: note clerestory windows which give added light to the den.

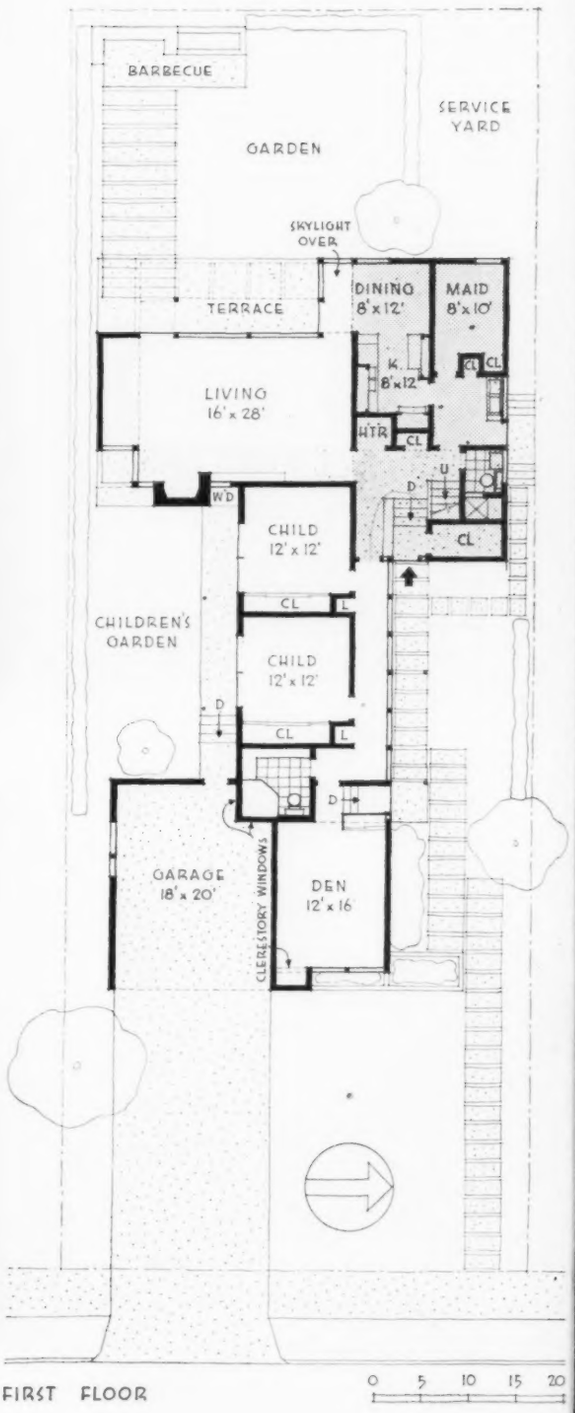
Ben Berg

View from the main entrance: pipe columns and door (right) are gray blue.

Julius Shulman

Entrance hall: stairs lead up to master bedroom; coat closet under stairs.

SECOND FLOOR



FIRST FLOOR

HOUSE IN LOS ANGELES

GREGORY AIN, Designer; VISSCHER BOYD, Associate

The living room opens on the rear garden; dining alcove has an 8-ft. skylight over one end.

Clear-glass window overlooks children's garden; behind obscure-glass panels are artificial light sources.

Photos by Julius Shulman

Walls are light-yellow plaster and plywood; carpet is terra cotta; upholstery, blue and yellow.

SECOND FLOOR

FIRST FLOOR

PLANNED TO MEET CLIMATIC CONDITIONS

Requirements for this residence in San Antonio, Tex., were simple. Designed by Architects ATLEE B. & ROBERT M. AYRES for a real-estate firm, the house simply required a plan that would meet local climatic conditions—hence the large number of windows throughout — and would provide three bedrooms and two baths.

BECAUSE THE CLIMATE in San Antonio is warm during most of the year, ventilation is an important consideration. The architects, knowing their climate, planned the house so that all main rooms would have cross ventilation. As a further protection, the house is insulated with shredded wood fibre. Exterior walls are brick veneer, painted white; interior walls are smooth-finish plaster; interior partitions are of expanded metal lath and stucco. Floors in main rooms are of oak; linoleum was used in the kitchen, and tile in the baths. The house has a forced warm-air heating system. Total cost was $13,000.

Photos by Harvey Patterson

Photos by Daniel Reynolds Merrill

MODIFIED COLONIAL FOR INFORMAL LIVING

This residence, designed by Architect J. LLOYD BERRALL for Mr. and Mrs. G. K. Bachmann and their six-year-old daughter, is in Short Hills, N. J. The only unusual requirement was that there be no formal dining room. This made possible a very large living room.

ALTHOUGH THE CHARACTER of this house is reminiscent of traditional forms, the detail is considerably simplified. The gray-green color of the house blends with the foliage of the surrounding trees; trim is white. Inside, the woodwork is stained honey color and waxed. Walls are papered, except in the paneled living room, and in kitchen and baths where wall linoleum was used. One end of the living room serves as dining area for the family's evening meal; for buffet suppers, the writing-desk fronts of the bookcases (see living room, below) are convenient accessories to serving. The unfinished third floor can be made into a guest suite.

SECOND FLOOR

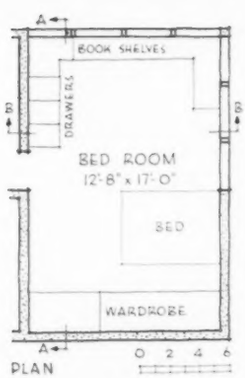
FIRST FLOOR

BEDROOMS

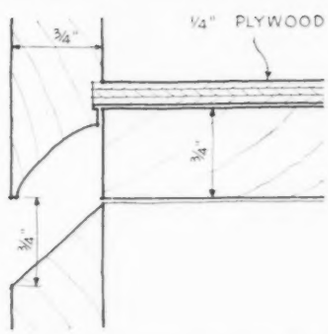
Whether in residences, hotels, or apartments, bedrooms today feature an increasing use of built-in furniture. Here are four examples, showing a wide variety of such equipment.

1. RAPHAEL SORIANO, Designer

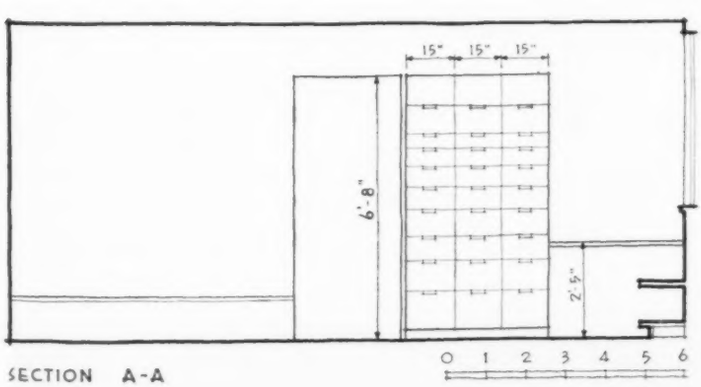
THIS MASTER BEDROOM includes, besides plenty of space for taking care of personal effects, shelves for books, drawers for papers and files, and a desk. The large chest, of ponderosa pine, has 30 drawers of varying depths. Ceiling and walls are of puddy-coat plaster, covered with heavy canvas and painted. Floor is of hardwood maple. The bedroom opens on to a hall from which are accessible the roof deck and the bathroom.



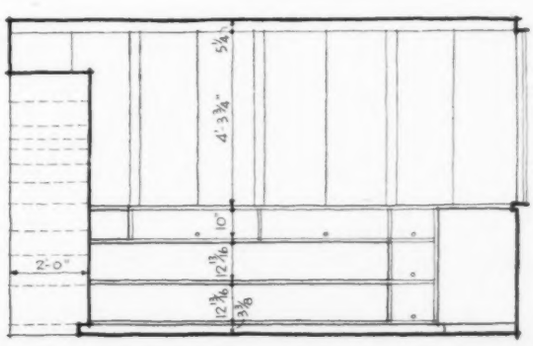
PLAN



SECTION THROUGH DRAWER PULL

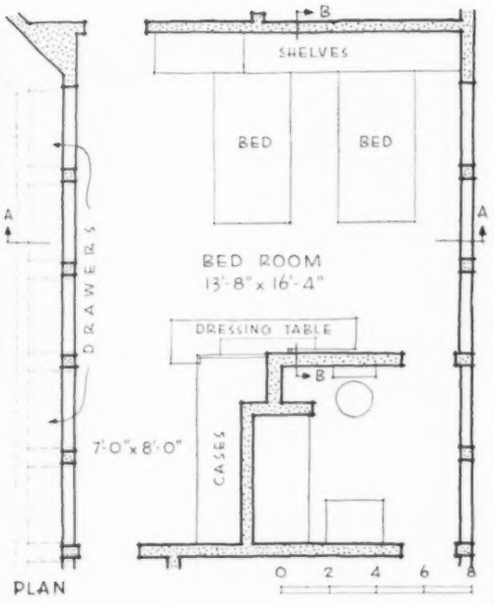


SECTION A-A



SECTION B-B

Photos by Elmer L. Astleford



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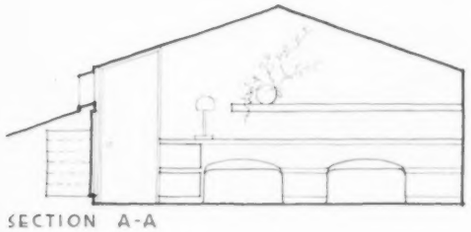

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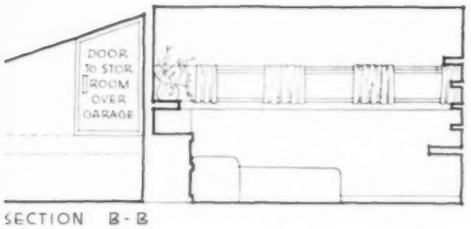
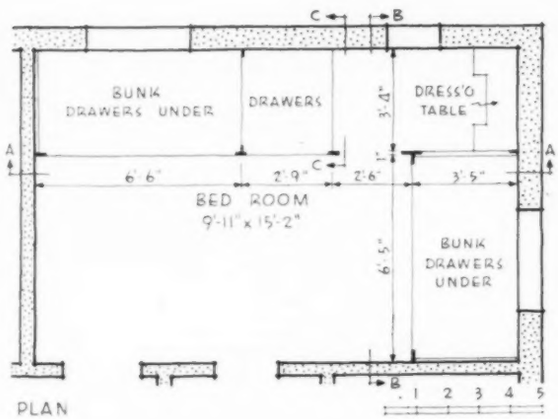


SECTION B-B

2. ALDEN B. DOW, Architect

ALL FURNISHINGS in this room—except beds and chairs—are built-in; this considerably increases both the storage facilities and the amount of free floor space. Built-in trays and drawers, located under the clerestory windows along one wall of the room, are made possible by the abutment of the lean-to roof which covers part of the first floor. Full-length closets with sliding doors are also provided. A dressing table, full-length mirror, and book shelves form a unit along one wall. The headboard of the bed provides shelf space at the ends for books, and, over the beds, for lamps. The walls are of natural sand float-finish plaster. Woodwork and full-length closets are of flat-grain fir; paneling and drawer fronts are ¾-in. plywood; all woodwork has paraffin-wax finish. The carpet is emerald green; bedspreads are of red and white corduroy.

Ernest Graham



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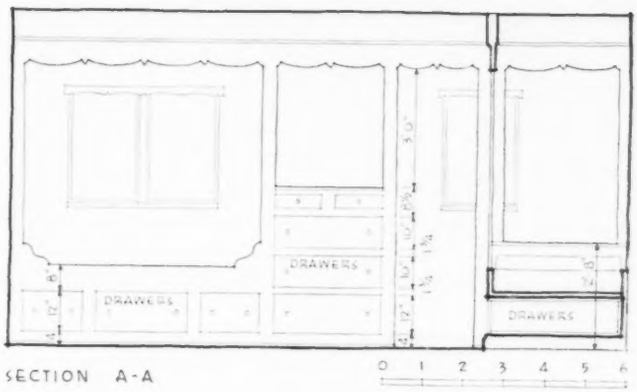
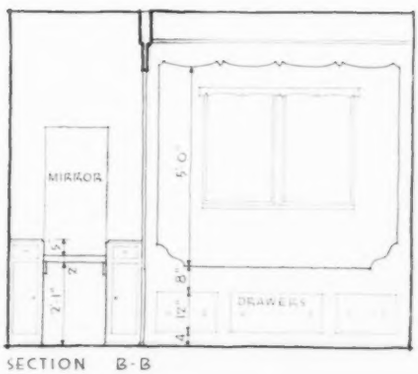


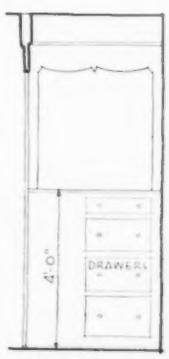
SECTION A-A

3. ROBERT M. LITTLE, Architect

BUILT-IN FURNITURE was necessary in this double bedroom because of the two main requirements: a maximum of storage space for bed linen as well as for wearing apparel, and ample clear floor area. Since space was at a premium, bunks were used, and drawers for each occupant are provided underneath. Despite the small area of the room it was possible to include a dressing alcove with a table. Woodwork is white; plaster walls are yellow, as are bedspreads. The rug is blue, and the curtains are of a figured material in red, blue, and yellow. Over each bunk is a reading light.



SECTION B-B



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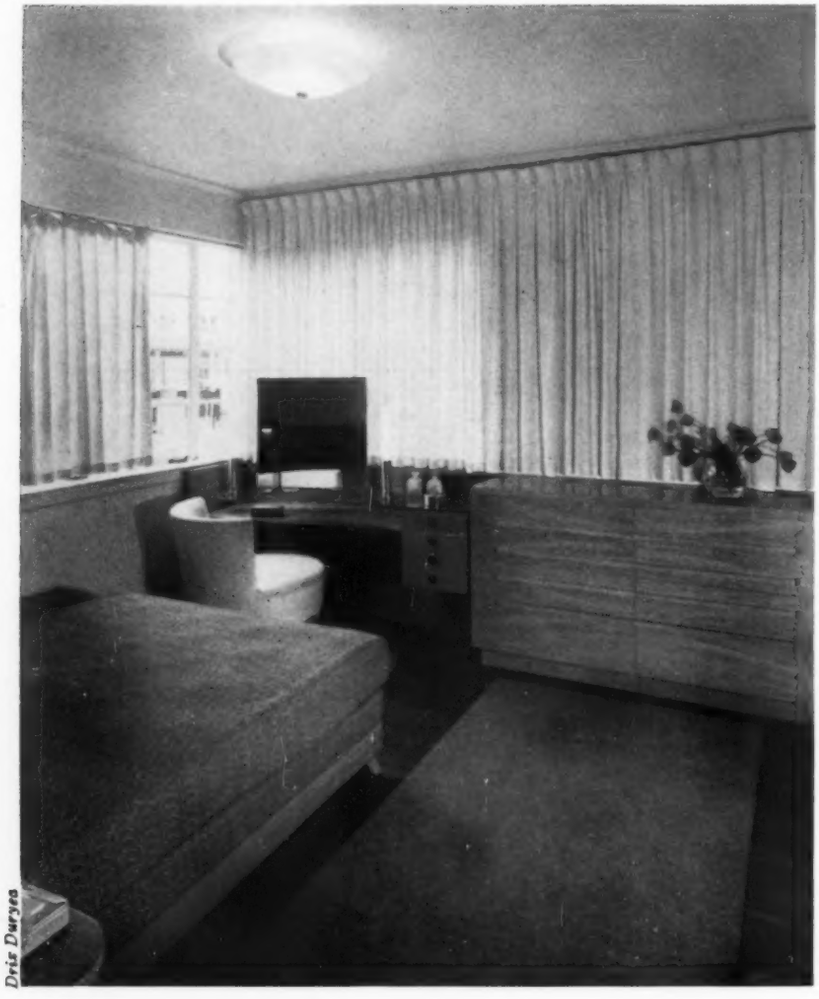
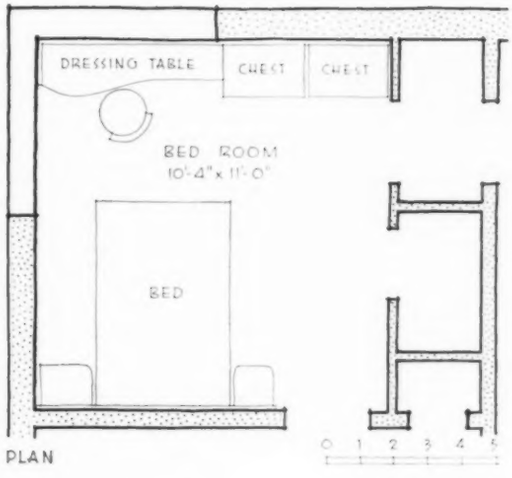


Dris Duryea



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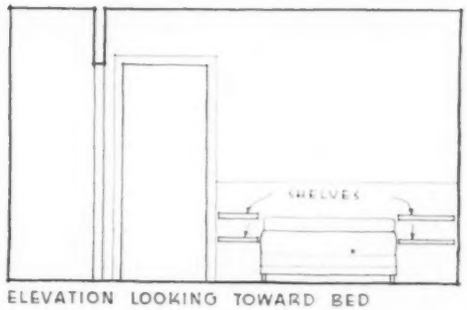
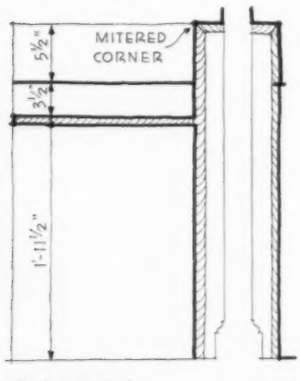


ELEVATION LOOKING TOWARD BED

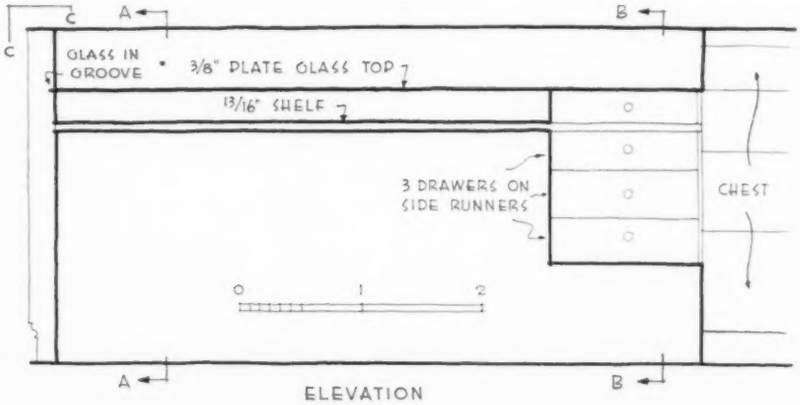
4. JOSEPH ARONSON, Designer

THE ACTUAL AREA of this room is small, but, by a compact arrangement of furnishings, the room does not appear crowded. Against one wall is a panel of Bayott wood, with cantilevered shelves at each end, which forms the headboard of the bed; attached to the panel are specially designed bedside lamps. On the opposite wall are twin chests of drawers designed as a unit, and a dressing table; these are also of Bayott wood. Mirror and tubular lamps are movable; below are details of dressing table.

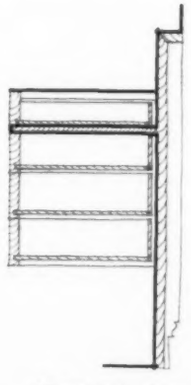


SECTION A-A

C-C

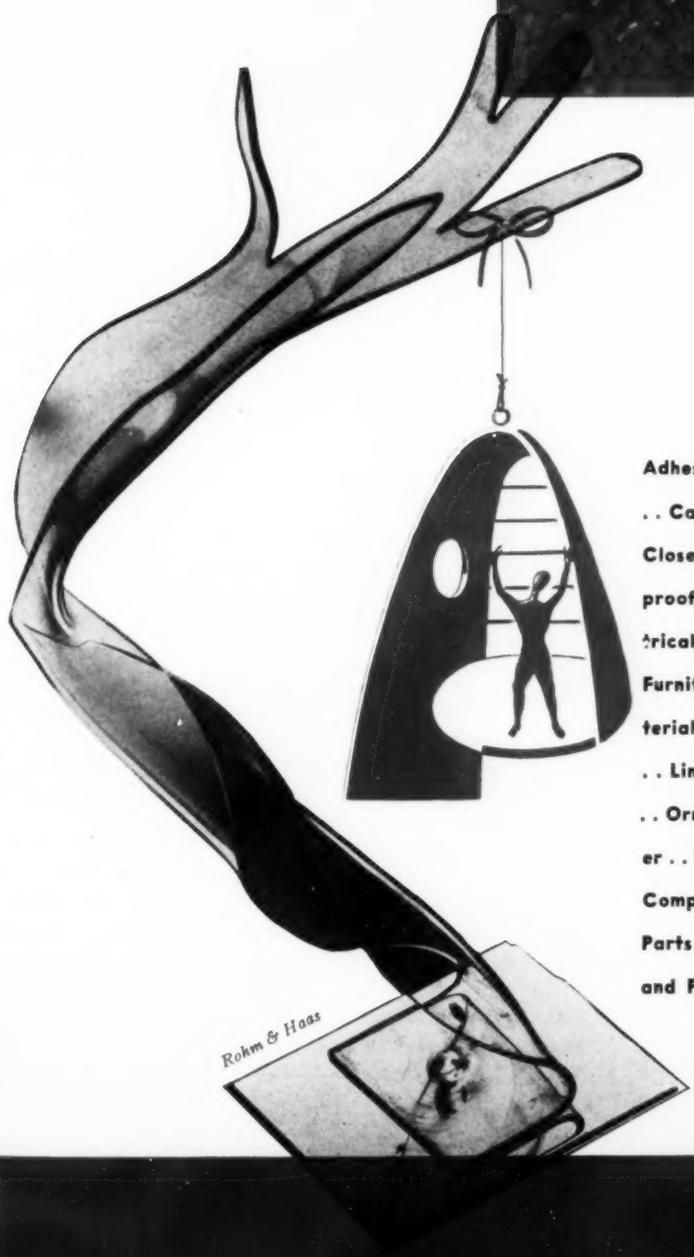


ELEVATION



SECTION B-B

Courtesy Bakelite Corp.



Rohm & Haas

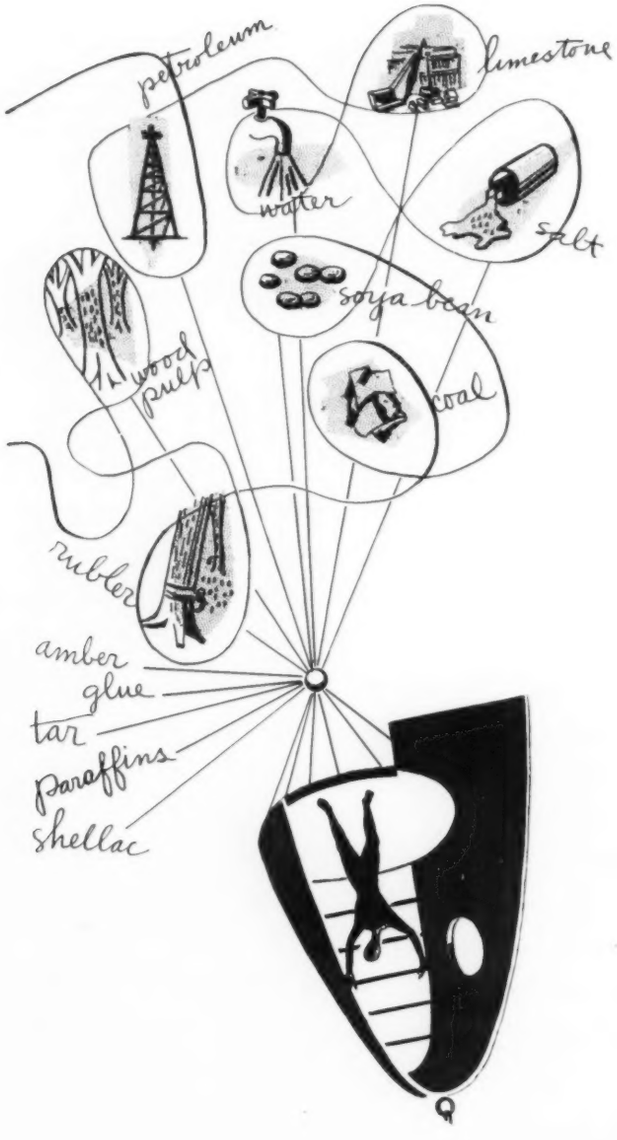
PLASTICS
AND ARCHITECTURE

Adhesives . . Balusters . . Bars . . Block, Translucent and Opaque . . Cabinet Work . . Carpentry . . Ceilings . . Cement Finishes . . Closet Seats . . Composition Flooring . . Counter Tops . . Dampproofing . . Doors and Trim . . Drainboards . . Enamels . . Electrical Parts . . Elevator Cabs . . Escutcheons . . Fabrics . . Furniture . . Glazing . . Grilles . . Hardware . . Insulation Materials . . Lacquers . . Lavatories . . Lenses . . Lighting Fixtures . . Linoleum . . Mastic Tile . . Mirrors and Reflectors . . Moldings . . Ornament and Sculpture . . Partitions . . Pipe . . Plywood Binder . . Pump Shafts and Impellers . . Rubber Compounds . . Sealing Compounds . . Shingles . . Signs . . Sills . . Stair Rails . . Switch Parts . . Tables . . Tank Floats . . Wainscoting . . Wallboards and Fabrics . . Waterproofing . . Varnishes . . Venetian Blinds

PLASTICS AND ARCHITECTURE

MORRIS SANDERS SURVEYS ONE OF AMERICAN BUILDING'S LIVELIEST POTENTIALS

The entire history of building has been one of adaptation of "natural" materials to man's specific structural needs. Only recently has he been able to "pre-design" materials with new properties or new combinations of old ones. The huge and complex family of synthetic plastics is a striking illustration of this new-found ability to arrange a few molecules in an almost limitless number of combinations, each with widely varying forms, properties, etc. Already the plastics have attained extraordinary significance in building design; and they promise more for the future. In this study, seventh in its series on major building materials, ARCHITECTURAL RECORD has asked Mr. Sanders, well-known New York architect and authority on plastics, to survey the field of modern synthetic plastics.

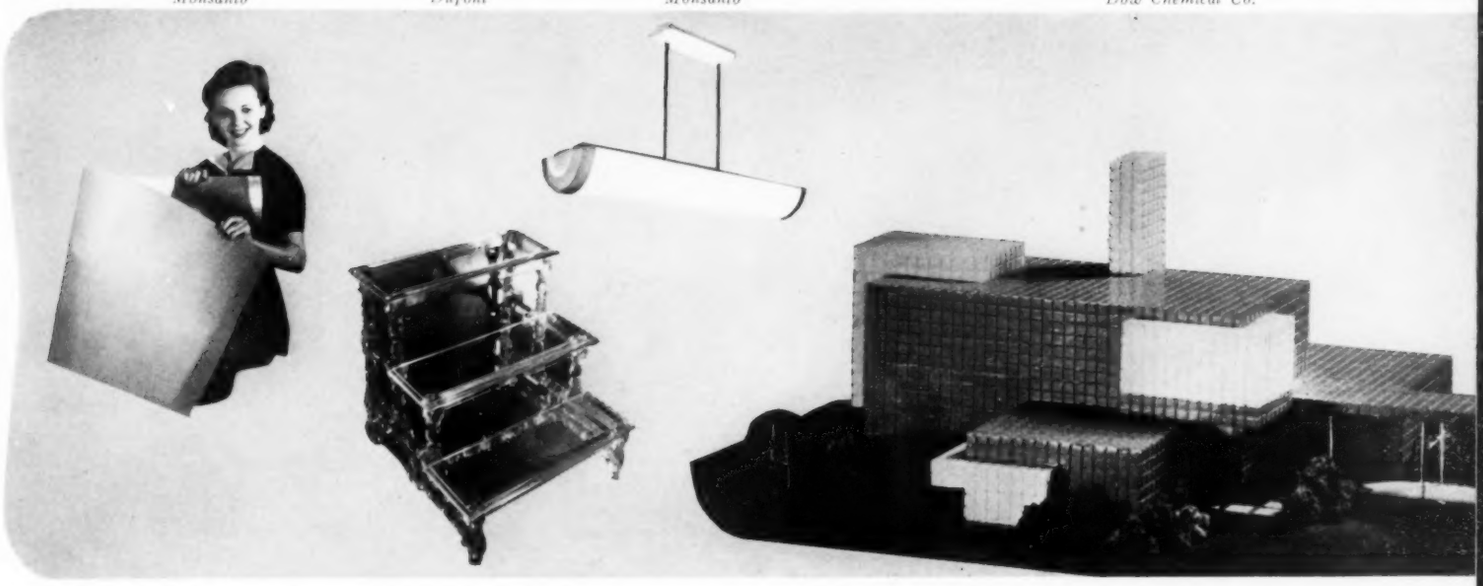


RECENTLY the popular press has given us an increasing number of feature articles on applied science. Of the "gee whiz" variety, they tell of super-stockings spun from a laboratory synthesis of air, coal, and a pinch of salt. And we learn that milk from Italian goats is being transmuted into a warm, wooly fabric; that German industry, cut off from the East Indies, is content with a homemade rubber substitute. These, like rayon, cellophane, bakelite, and scores of such materials, are among our modern synthetic plastics. They are plastic in the sense that they are nonmetallic, capable of being formed and molded at some stage of their careers—synthetic in that they are "made" rather than "found." Although originally devised as substitute materials, plastics, being made by man to his own specifications, are usually superior to their prototypes when, indeed, such exist. Celluloid was originally devised as a substitute for ivory, yet one can hardly call the subsequent cellulosic compounds in clear, flexible cellophane, or brilliantly colored molding form, imitative of ivory, glass, or any other older material.

Since the beginning of time, man has made use of plastics to caulk his ships, to glue his furniture, to create ornament. A partial list of the natural plastics includes: amber, paraffins, tar, bitumens and asphalts, rubber, resin, glue, gelatine, waxes, casein, copals, shellac. Most of these materials will always remain in use for reasons of cost, availability, or special aptitude. Shellac compounds, which have a very high resistance to electricity and carbonization, will always find use as an insulant; casein plastics, now derived from protein sources other than milk (soybean and corn), will continue in use as a base for novelties and buttons. Both casein and shellac have high hygroscopicity (sensitivity to moisture) and, being more natural than not, do not fairly come under the heading of modern plastics. It can be said that plastics are synthetic in the same sense that music is a synthesis of sounds, and stainless steel a synthesis of elementary minerals.

As has been remarked, the layman has read about these materials. Besides his literary acquaintance, he and his wife have an appreciation and respect for plastics based upon intimate use. His wife has daily proof of the beauty, variety of application, and myriad qualities of these materials. Their highly polished surfaces insulate her knife and pot handles; they transparently enclose her market purchases, provide tough but handsome housings and bodies for her household mechanical equipment.

Monsanto *Dupont* *Monsanto* *Dow Chemical Co.*



Plastics have come to play a brilliant and ubiquitous role in industry and in that special corner of industry which interests us—building. More cautious than many others, the building industry has found itself stirringly affected by these materials. Just as plastics revolutionized electrical and automotive manufacture, so, it would appear, are they likely to influence building. Architects have known of plastic electrical parts and decorative laminates for a decade or so. They have specified cellulose lacquers and plastic-covered closet seats. Some plastic hardware (generally of dubious design) has been available these past 10 years. But quite recent years have turned the parade of incoming plastics into a real *blitzkrieg*. Whereas one or two basic plastics were available about 10 years ago, there are actually scores of them today—all with varying qualities, characteristics, and applications. Before the World War, an architect's interest in plastics was limited to his transparent drawing instruments; today he wants to know everything about these materials that are making a ramifying advance into every branch of *materia architectura*.

At the beginning, a survey of the complex plastics field is discouraging. Even architects who took school courses in chemistry are mildly baffled by a new argot comprising such astonishing combinations as *methacrylate*, *cellulose acetate*, *butyrate*, and *vinyl chloride*. These and similar laboratory-born words and phrases twist the tongue and paint no mental image. Nor when manufacturers rechristen them is the situation improved. Brushing aside this barrier of cold, prickly words, we find the materials themselves—rich in color, simple in use, pleasant to touch. They are materials that a Frenchman would call "sympathetic," having a humanity about them shared only by wood and leather.

All plastics, whether liquid or solid, water clear or opaque, black or brilliant hued, hard or soft—all are classified under one of two headings, *thermoplastic* (heat-softening), and *thermosetting* (heat-hardening). Beyond this it is dangerous to generalize. In the following pages plastic characteristics will be discussed at some length.

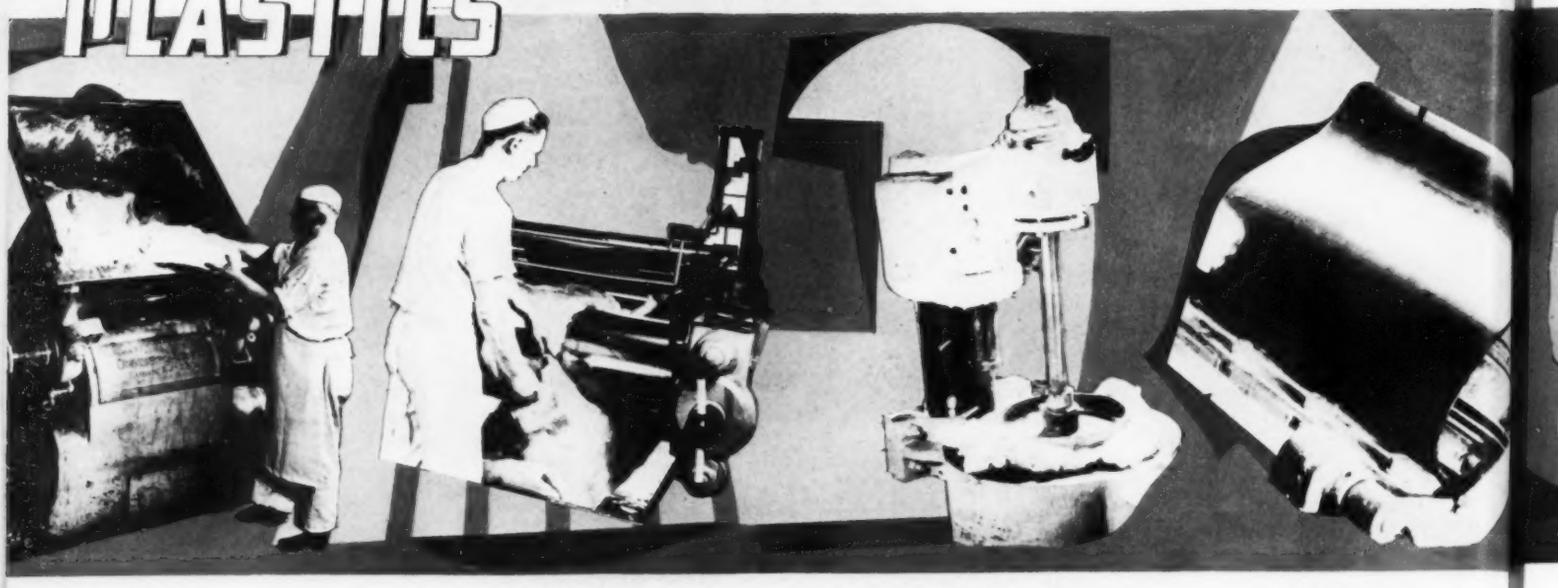
To look at their beginnings, we note that several of our modern plastics were foreshadowed in early nineteenth-century laboratory discoveries, and in the early 70's, celluloid, or pyroxalin, was commercially produced from nitrated cotton. After the World War, our greatly expanded guncotton plants found increased peacetime markets for cellulose nitrate. More important for architecture was the development of other cellulosic products that are noninflammable—acetate, butyrate, and ethyl cellulose.

Of even greater significance to building was the debut of thermosetting plastics around 1910, when a phenol-formaldehyde resin was made available. First exploited for its splendid insulating qualities, it came into building use in electrical equipment and housing forms. Before long, its hardness and beauty recommended it for architectural application as a laminated product. Another thermosetting and even more colorful plastic arrived in 1929—urea formaldehyde.

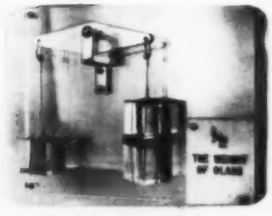
The years following the stock-market crash have been bitter for most industries. They have been years of growth and improvement for plastics, an industry that has taken no steps backward, known no depression. A decade ago plastics tiptoed self-consciously into building—today they are in every part of the house from cellar to roof. Besides their obvious and recognizable uses, they are necessary concomitants of glass-wool insulation and improved paint, lacquer, rubber, and flooring materials; there are many cases of plastics replacing older "found" materials; there are equally notable cases of plastics bringing new life to such natural materials. Certainly the weatherproof plywoods, bonded metal, and shatterproof glass are deeply indebted to these products of the organic chemist's laboratory.

The manufacturing chemist may know his plastic as one of endless permutations and combinations of hydrogen, oxygen, and carbon atoms. The molder handles the material in chip or powder form. If set up for compression molding, he may manufacture finished articles, using expensive steel dies, heat, and great pressure. The architect's influence on such design is remote and indirect. Many plastics are cast or extruded in the forms of sheets or rods in varying thicknesses. They can easily be turned, machined, and worked by craftsmen under the architect's direction. Reshaping by heat is a simple operation once the craftsman has become familiar with his plastic, bearing in mind the fact that softening points (as well as other characteristics) vary with each particular substance.

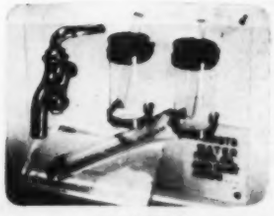
PLASTICS



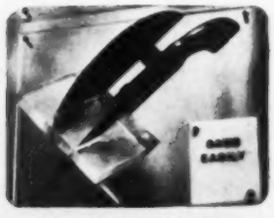
MIXING LUMPING PROCESSING ROLLING



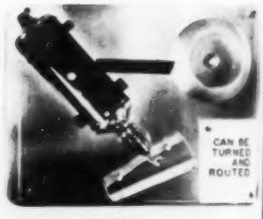
LIGHT WEIGHT



RESISTANT



SAWS EASILY



WORKS WELL

NON-SHATTERABLE

"BENDS" LIGHT

CRYSTAL CLEAR . . .

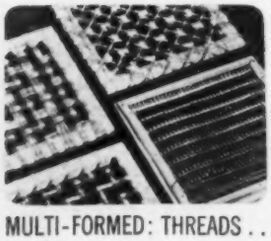
. . . IN ANY THICKNESS

HOMOGENEOUS

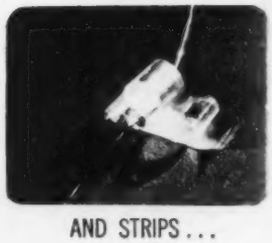
MOULDABLE

ELASTIC

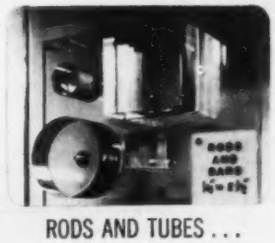
MULTI-COLORED



MULTI-FORMED: THREADS . .

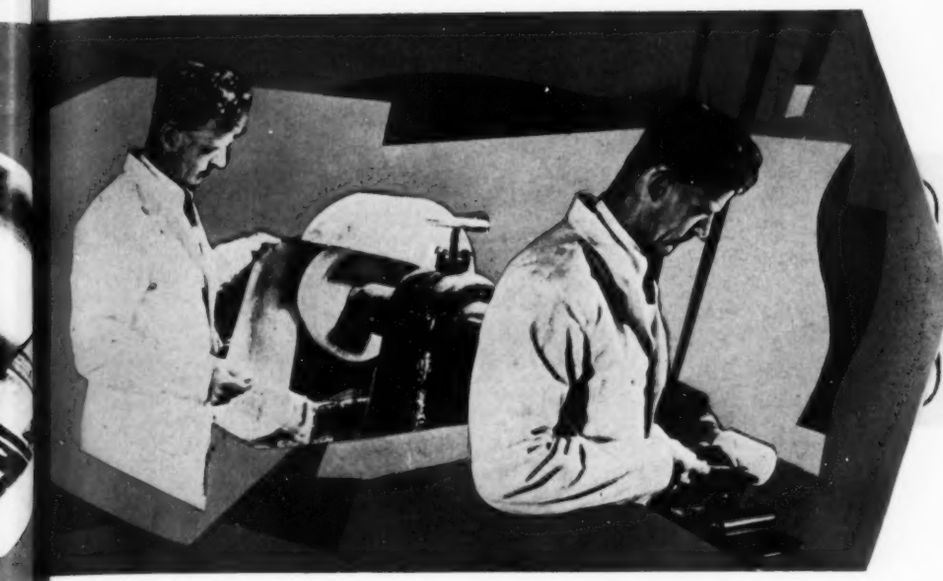


AND STRIPS . . .



RODS AND TUBES . . .

OR SHEETS



THERMOPLASTICS

POLISHING LATHING

THE HEAT-SOFTENING PLASTICS have been in use much longer than the heat-hardening group. As the name *thermoplastic* implies, they can be softened and reshaped by heat. Existing as solids with dimensional stability up to a heat range varying between 130° F and 180° F, they are available for building use as finished factory-made products or in sheet, rod, tube, or extruded molding form. Stocked by plastic dealers much in the manner of lumber, they can be ordered in varying degrees of thickness, lucency, or color. In recent years architectural craftsmen have become quite familiar with the machining of the better-known materials, finding them easier to work and more versatile than glass, wood, or metal.

The plastics manufacturer mixes color agents in with plastic powders. The molder actually produces finished products or stock forms. In the case of most plastics, sheets are rigid and tough but they may be highly flexible and fabric-like as in the case of some vinyl compounds.

In any list of general thermoplastic classifications, some special qualities may be briefly noted. Some of the members of this group are tougher, more colorful, more resistant to moisture, weather, chemicals, and more colorable than those in the thermosetting group. Others are less so. Only one generalization can be made: this group (thermoplastics) tends to flow again when subjected to reheating.

Transparent polystyrene and acrylic resins, easy to heat-bend and as clear as quartz, are increasingly used for illuminated signs and for ceilings and cornices as well. They are being used as a substitute for glass as a lightweight translucent roofing and wall unit.

The cellulosic compounds, among the least expensive of the plastics, are finding new uses. So-called "butyrates," they are taking the place of woven reed in the porch-furniture field.

Ethyl cellulose is a clear new cellulose ester that is unusually tough. As wire insulation it can be kinked tightly at low temperatures without cracking.

Vinyl resins, new comers in a new field, are among the most versatile and architecturally significant of all heat-softening plastics. Elastic, transparent films of vinyl plastics can be webbed over chair frames; thinner films protect fragile cloth upholstery. In colorful opaque form, tough as leather and more resilient than rubber, vinyl plastics should have a secure future as upholstery and for bathroom walls.

CELLULOSE NITRATE
1.* Water resistant, tough—flammability limits its architectural use.
2.† Drafting instruments, toilet seats, tool handles, dials.

CELLULOSE ACETATE
1. Strength, fabricating versatility, high dielectric strength, transparency, noninflammability, easily welded.
2. Hardware, electrical appliances, and other molded forms; light shades, transparent protective and translucent sheeting, lacquers.

CELLULOSE ACETATE BUTYRATE
1. Weather and water resistant, transparent, colorable.
2. Interior and exterior application for lenses, cases, furniture.

ETHYL CELLULOSE
1. Excellent low-temperature flexibility, resistant to electricity and heat.
2. Protective coatings, extrusion wire insulation, lacquers.

ALKYD RESINS
1. Excellent resistant and weathering qualities, long life.
2. Paints, finishes, lacquers.

ACRYLIC RESINS
1. Water clear, edge lighting, tough, rigid, weather resistant, easily machined, bonds well to metal.
2. Compound curved windshields, decorative articles and lighting, signs, displays, furniture. Flexible coatings for leather and rubber.

PARACOUMARONE-INDENE RESINS
1. Highly resistant to weather and chemicals.
2. Component of superior mastic tile, roofing, flooring, etc.

STYRENE RESINS
1. Crystal clarity, low water absorption, resistant to chemicals, easily molded.
2. Edge lighted and decorative uses, translucent building blocks, signs.

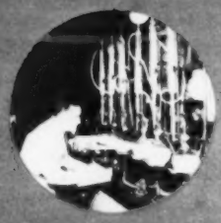
VINYL RESINS
1. Many varying vinyl types, can resemble rubber; tough, insensitive to moisture and chemicals, stable, has fine adhesive qualities.
2. Interlayer sheet for safety glass, furniture upholstery, molded products and ingredient for flooring, paints and lacquers, sealing glass, bricks, "scotch tape," etc.

*Special qualities. †Typical uses.

Photographs from Du Pont, Rohm & Haas, Celluloid Corp., Tennessee Eastman, Bakelite Corp.

PLASTICS

FORMULA
phenol + formaldehyde



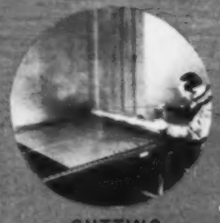
TESTING

COLORING

POURING

CHECKING

SLICING



CUTTING

BONDING

BENDING

MOULDABILITY

WORKABILITY

TRANSLUCENCE

HOMOGENEITY

LIGHT WEIGHT

FLEXIBILITY

ACID-, WATER-, HEAT-RESISTANCE

THERMOSETTING

SYNTHETIC RESINS that first flow under heat and pressure and then cool to a permanent form are called *thermosetting* plastics. They set much in the manner of concrete, and heat will not make them soft again. At present this heat-setting group is of primary importance to architecture—for superior electrical insulation, paint, cabinet work, and plywood, to name the most common uses.

Those of these plastics which are of coal-tar origin (phenol) have limited color ranges, but urea possess great lucency and have a color range that is literally unbounded.

Beyond the obvious observation that the heat-hardening plastics are more heat resistant than the heat-softening, further generalizations are difficult. Molded in pure form or with a variety of fillers (asbestos, diatomaceous silica, cotton flock, and wood flour) they are generally more permanent under most conditions—and more expensive—than comparably manufactured thermoplastics.

Usually requiring great heat and pressure to mold, they reach the building trade as finished articles or in laminate form, capable of some machining, but of less than the heat-plastic group. The exceptions to this rule are the cast phenolics.

Cast phenolics are produced from resins in a liquid state. Cast in molds, the resin is subjected to high heat and some pressure over a period of several hours—as against the very high pressure (1000 to 10,000 lbs. per sq. in.) and speed of the usual thermosetting die-molding operation. Cast phenolics are not unlike many of the thermoplastics in general appearance—clear and colorful. They do not resoften under heat and are generally unaffected by water, mild acids, oils, and most reagents. The architectural uses of cast phenolics have been only partially explored.

Laminated phenolics are made by applying heat and pressure on built-up layers of paper and fabric that have been impregnated with unpolymerized (raw-state) resin. This group of plastics is already well-known to architects. Translucent laminates made of urea resin make excellent light diffusers and should find more frequent architectural application as illuminated walls, columns, elevator cabs, and ceilings. A satisfying variety of inlay and decorating treatments is available to the designer working with plastic laminates.

CAST PHENOLIC RESINS

1.* Unlimited range from opaque to transparent, noninflammable, rigid and strong, easily cast or machined, heat resistant.
2. †Decorative applications, sculptural uses, signs, displays, housings, hardware, light fixtures, varnishes and adhesives, lately as pump parts and special water piping.

PHENOL FORMALDEHYDE

1. Variety of properties; heat, water, and chemical resistance, electrical insulation, moldability, dimensional stability, tough and strong, colors somewhat limited, wear resisting.
2. Molded housings, hardware, corrosion-resistant parts of all kinds, as a laminate for furniture and cabinet work, as bond for weatherproof plywoods and veneers. Superior paints, lacquers, and enamels.

UREA FORMALDEHYDE

1. Wide degrees of lucency, unlimited color range, unaffected by sunlight, light in weight, shatterproof and rigid, without taste and odor, good light diffuser.
2. Molded hardware (unaffected by body acids), superior lighting reflectors, housings, wiring devices. Laminated: walls, furniture, cabinet work, shop fronts. Used to bond new weatherproof veneer and plywoods. Cold-setting cement, baking enamels.

FURFURAL PHENOL RESINS

1. Superior moldability, resistant to water, chemicals, and high heat. Colors quite limited, economical.
2. Molded electrical parts, varnishes, oil-burner housings.

LIGNIN PLASTIC

1. An interesting newcomer, by-product of pulp manufacture, now available as a hard black sheet with excellent qualities. Lignin plastic suggests itself for architectural use as a laminate.

LAMINATES

1. Possessing properties of color and translucency of plastic used; beautiful durable surfaces, resistant to cigaret burns; variety of patterns and textures. Decorative metal and plastic inlays practical.
2. Elevator cabs, wall covering, table tops, fronts, cabinet work, signs, furniture.

*Special qualities. †Typical uses.

Photographs from Catalin Corp., Bakelite Corp., Durez Plastics & Chemicals, Inc., American Cyanamid and Chemical, Westinghouse, H. H. Robertson Co., Plaskon Co.

PLASTICS

Louis Werner

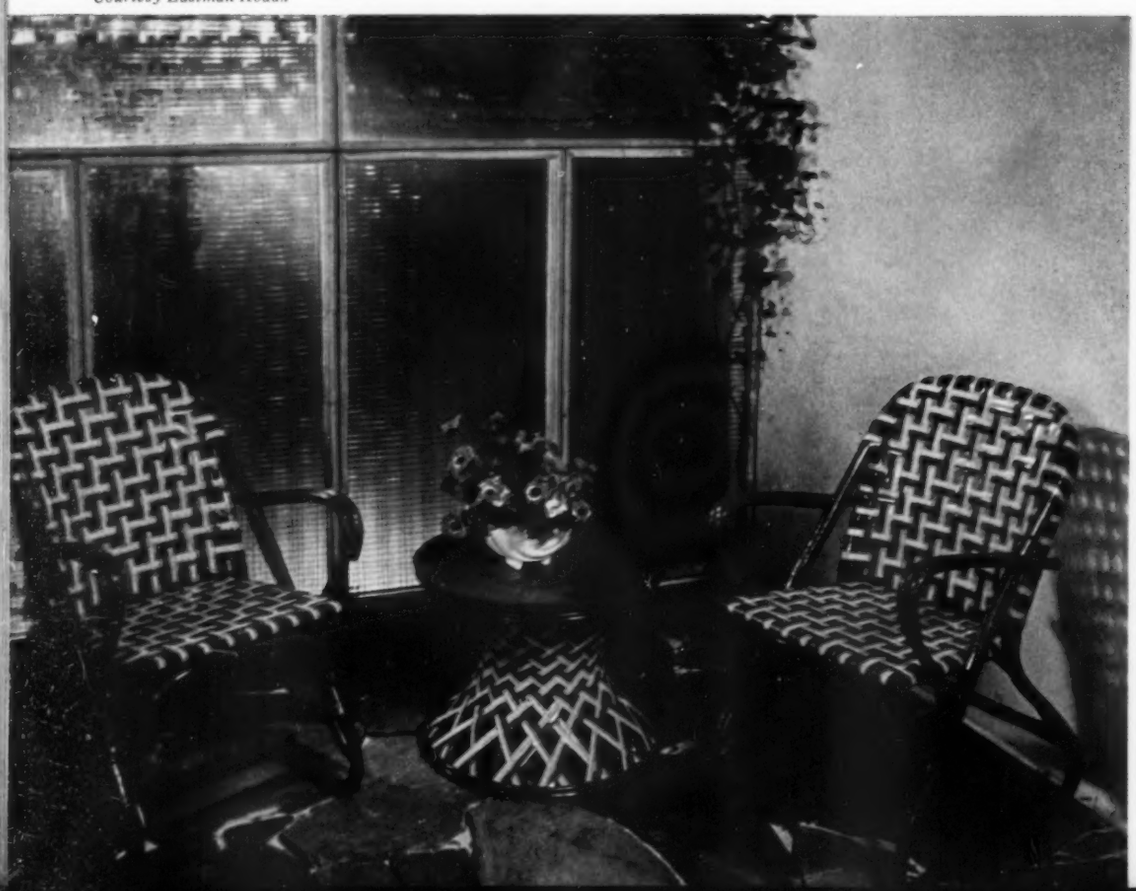
Courtesy General Electric Co.

FURNITURE design has felt the impact of plastics because of their extraordinary versatility in both performance and form. Transparent sheets for table and chairs (left and center below), laminated table tops with paper-thin wood veneers (above), "wicker" upholstery both water-clear and colored for chairs (lower left and right) are among forms taken.

Courtesy Metropolitan Museum of Art

WOVEN SCREENS of a translucent weatherproof plastic keep this terrace windless and private.

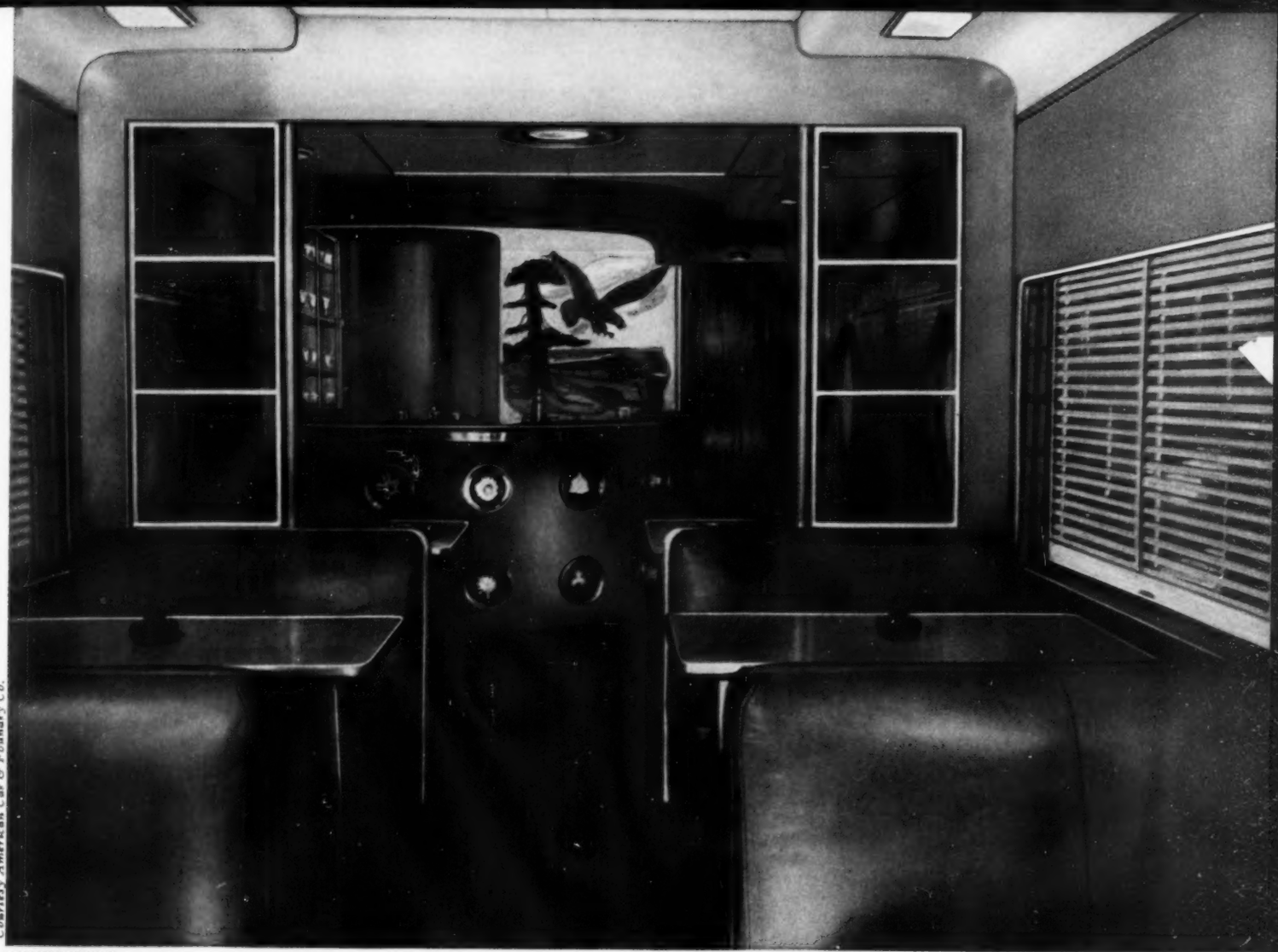
Courtesy Eastman Kodak



SIGNS of edge-lighted plastic

Louis Werner

Courtesy American Car & Foundry Co.



Courtesy American Car & Foundry Co.

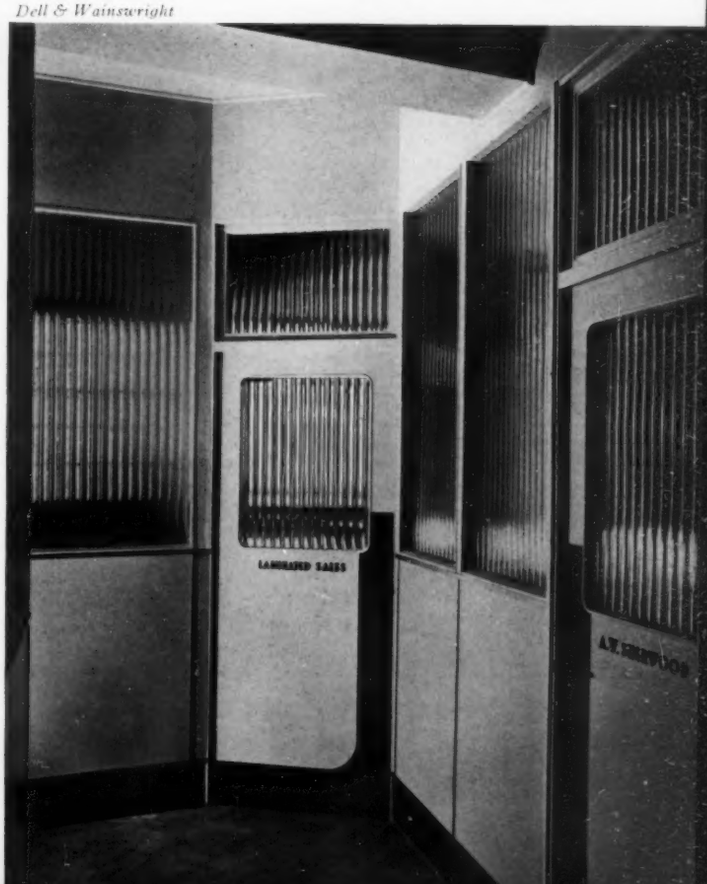
INTERIORS of the new streamliners, such as the bar-car above, show a wide use of plastics in many forms as walls, table and bar tops.

ROOFS of a new lightweight translucent plastic tile light this bath house.

Elmer L. Astleford

DOORS of plastic laminates are rigid, light, sanitary, and colorful

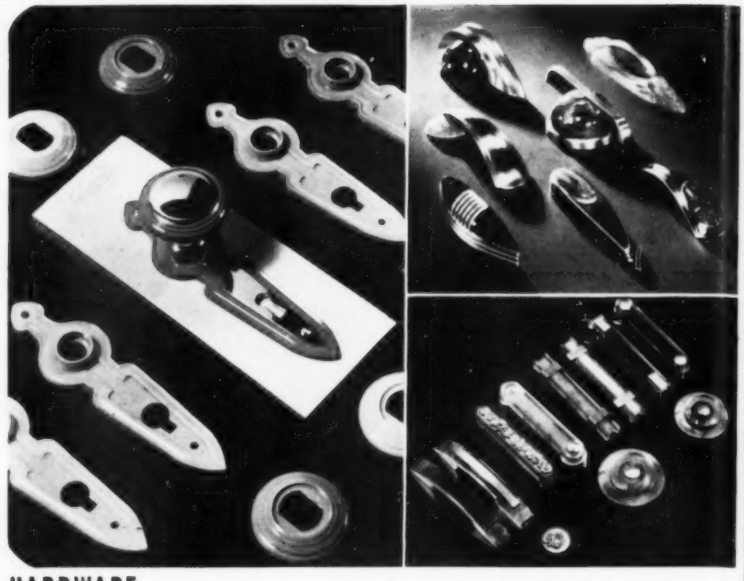
Dell & Wainswright



PLASTICS

BAR TOPS

Lockwood Hardware, Tennessee Eastman, Bakelite

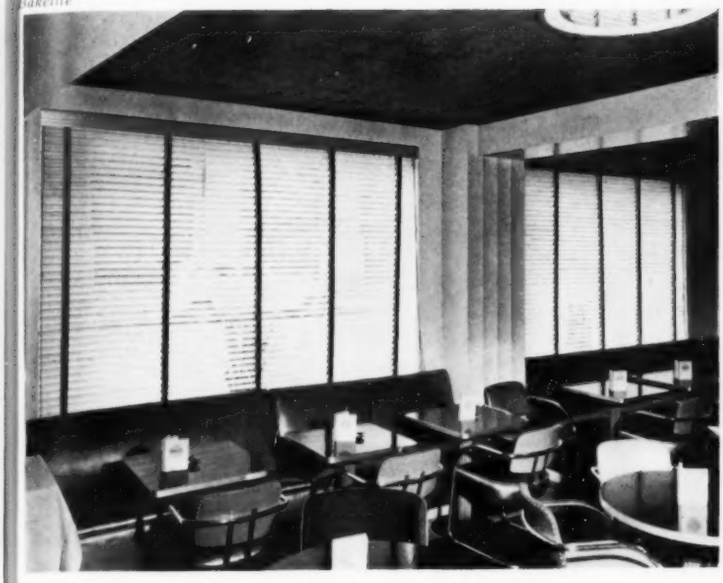


HARDWARE of all sorts is now being easily fabricated in plastics.

PARTITIONS in a wide variety of colors and transparencies are now possible with this new experimental plastic block for interior uses.

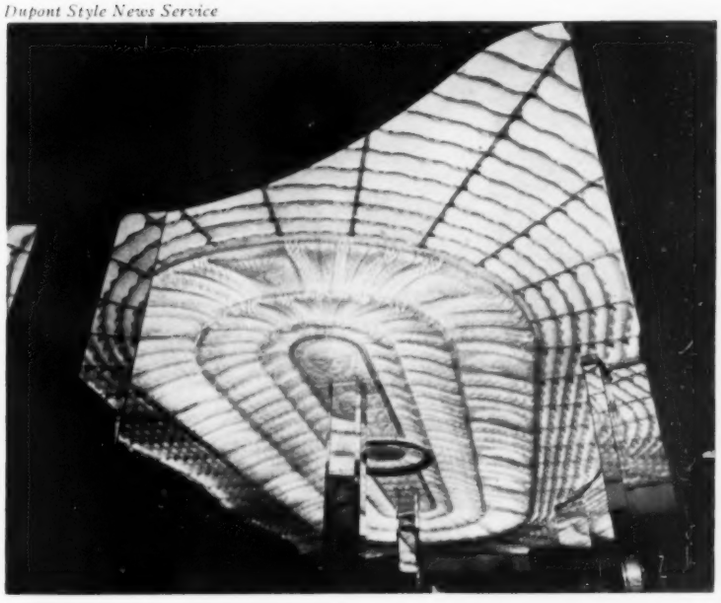
Gabriel Moulin, from Dow Chemical Co.

Bakelite



VENETIAN BLINDS of translucent plastics increase light diffusion.

Dupont Style News Service



CEILING of this night club is molded plastic, back lighted.

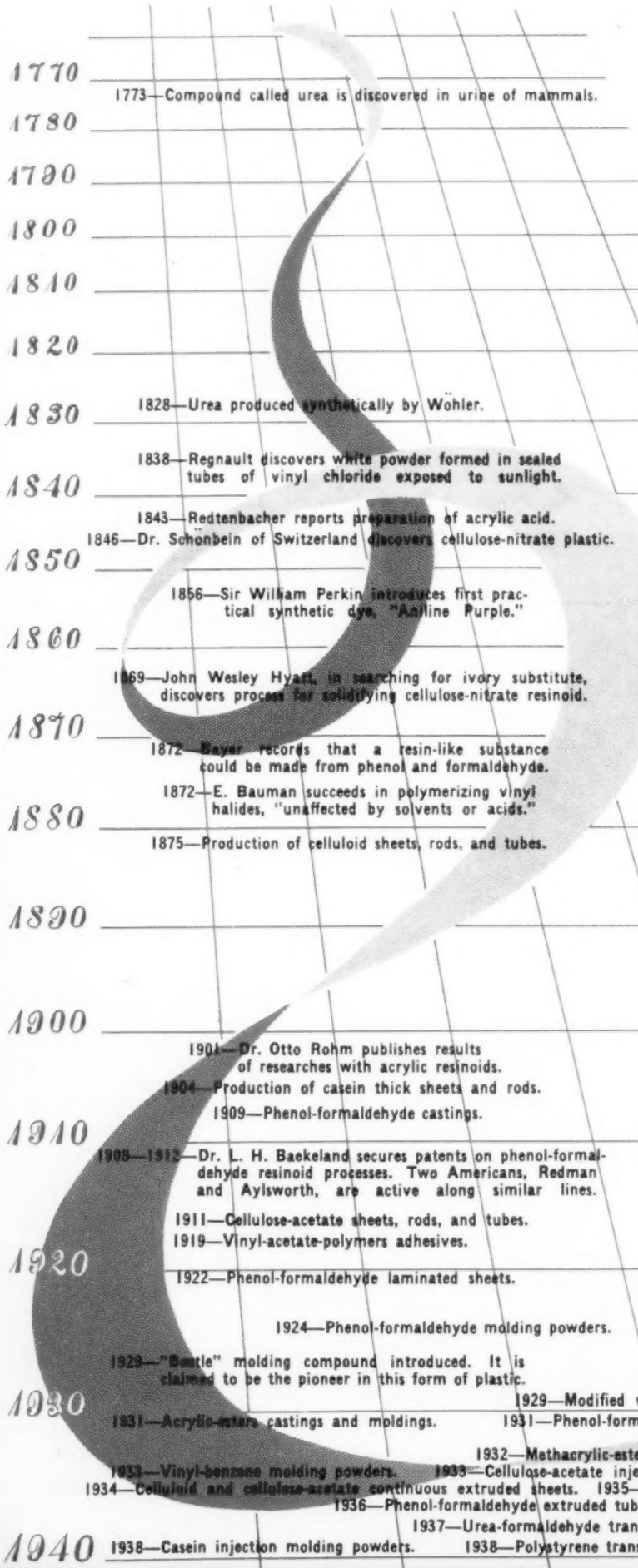
COUNTERS of plastics are resistant to burns, water, and most acids.

Ezra Stoller, from Formica Co.

FLOORS in this new vinyl tile have all the properties of rubber.

Elmer L. Astleford, from Carbon and Carbide Chemicals Corp.

PLASTICS


1770
1773—Compound called urea is discovered in urine of mammals.
1780
1790
1800
1810
1820
1830
1828—Urea produced synthetically by Wöhler.
1838—Regnault discovers white powder formed in sealed tubes of vinyl chloride exposed to sunlight.
1840
1843—Redtenbacher reports preparation of acrylic acid.
1846—Dr. Schonbein of Switzerland discovers cellulose-nitrate plastic.
1850
1856—Sir William Perkin introduces first practical synthetic dye, "Aniline Purple."
1860
1869—John Wesley Hyatt, in searching for ivory substitute, discovers process for solidifying cellulose-nitrate resinoid.
1870
1872—Bayer records that a resin-like substance could be made from phenol and formaldehyde.
1872—E. Bauman succeeds in polymerizing vinyl halides, "unaffected by solvents or acids."
1875—Production of celluloid sheets, rods, and tubes.
1880
1890
1900
1901—Dr. Otto Rohm publishes results of researches with acrylic resinoids.
1904—Production of casein thick sheets and rods.
1909—Phenol-formaldehyde castings.
1910
1908—1912—Dr. L. H. Baekeland secures patents on phenol-formaldehyde resinoid processes. Two Americans, Redman and Aylsworth, are active along similar lines.
1911—Cellulose-acetate sheets, rods, and tubes.
1919—Vinyl-acetate-polymers adhesives.
1920
1922—Phenol-formaldehyde laminated sheets.
1924—Phenol-formaldehyde molding powders.
1924—Urea-formaldehyde cast forms.
1929—"Beetle" molding compound introduced. It is claimed to be the pioneer in this form of plastic.
1929—Modified vinyl-acetate powders, films, and sheets.
1930
1931—Acrylic-esters castings and moldings.
1931—Phenol-formaldehyde modified cast resins.
1931—Urea-formaldehyde laminated sheets.
1932—Methacrylic-esters castings and moldings.
1933—Vinyl-benzene molding powders.
1933—Cellulose-acetate injection molding powders.
1933—Benzyl-cellulose sheets, rods and tubes.
1934—Celluloid and cellulose-acetate continuous extruded sheets.
1935—Vinyl-chloride-polymers and mixed-polymers sheets, rods, powders, and films.
1936—Phenol-formaldehyde extruded tubes.
1936—Ethyl-cellulose sheets and powder.
1937—Urea-formaldehyde transparent molding powders.
1940
1938—Casein injection molding powders.
1938—Polystyrene transparent molding powders.
1939—Cellulose-butyrate molding powders.
?

As an epilogue to surveys of this type, custom demands that we draw the veil aside and peer into the Great Beyond. Will the house of the future resemble the umbrella of today in that flexible plastic fabric stretched over tense curved framing members will comprise its walls-flowing-into-roof? And will the housewife, clad entirely in plastic (if clad at all) in this remote era, dissolve her soiled plastic dishes down her plastic drains, replacing them with fresh ones as cheaply available as paper napkins today?

Cost and availability are the clue to plastics' future. The versatility and universal application of the material are recognized by the consumer and only require further technical familiarity on the part of the manufacturer and designer. In speculating on the future within the covers of a technical publication, we must (not too regretfully) avoid the Sunday Supplement approach. The facts and probabilities are as stimulating as fancy.

Although reasonable in cost today, plastics may become even cheaper as increased usage swells and stabilizes production. As a parallel case we can consider aluminum which once cost two dollars a pound in ingot form and came down to its present twenty-cent level in reasonable stages made possible by large-scale production. The raw materials for plastics will always be easily available and, happily enough, need never be provided at the expense of our national resources. Farm products such as soybeans, cotton, and molasses; waste products such as sawdust and sulphite liquors; by-products of coke and petroleum are the commonest sources of plastics.

The day that a surface hardness comparable to glass is added to the long list of plastic properties, there will be few new plastic worlds to conquer other than better design and sounder application.

The immediate future of plastics in architecture can be illustrated by considering one highly functional room, the bathroom. The use of plastic closet seats and shower curtains is common practice. Used to a lesser degree are plastic hardware, fittings, laminated walls, and lighting fixtures. A wider variety of plastic wall- and ceiling-surfacing materials (opaque and translucent), hardware, fittings, and lighting fixtures is indicated. It is logical to expect molded inner-light cabinets and molded furniture, basins, and tubs. The use of plastic plumbing abroad has been limited but its development in low-cost U. S. housing would be practical. In other words, plastics may very well be represented in every part of the bathroom—and in the other rooms as well. Once the architect and designer become fully appreciative of their plastic materials, the manufacturing lag will lessen—and the designs will improve.

We cannot foresee whether basin and wall will be molded all in a piece or whether the plastic used in the tub of the future will be limited to a replaceable, comfortable-to-touch liner. We cannot draw an accurate diagram of the future of plastics in architecture. Of one thing we can be sure: that future will be great and all-embracing.

CURRENT TRENDS OF BUILDING COSTS

Compiled by Clyde Shute, Manager, Statistical and Research Division, F. W. Dodge Corporation, from data collected by E. H. Boeckh & Associates, Inc.

CURVES INDICATE trend of the combined material and labor costs in the field of residential frame construction. The base line, 100, represents the U. S. average for 1926-1929 for residential frame construction.

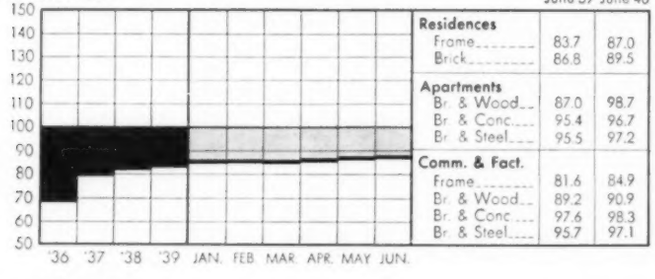
Tabular information gives cost index numbers for the nine common classes of construction. The base, 100, in each of the nine classes represents the U. S. average for 1926-1929 for each particular group. The tables show the index numbers for the month for both this year and last.

Cost comparisons, as percentage differences for any particular class of construction, are possible between localities or periods within the same city by a simple process of dividing the difference between the two index numbers by one of them. For example: if index for city A is 110 and index for city B is 95 (both indexes for A and B must be for the same class of construction), then costs in A are approximately 16% higher than in B $\left(\frac{110-95}{95} = 0.158.\right)$ Conversely it may be said that costs in B are approximately 14% lower than in A $\left(\frac{100-95}{110} = 0.136.\right)$

Similar cost comparisons, however, cannot be made between different classes of construction since the index numbers for each class of construction relate to a different U. S. average for 1926-1929.

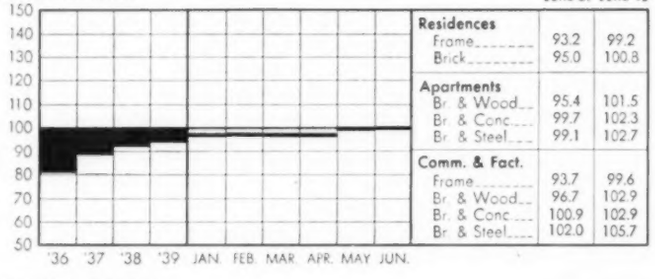
CONSTRUCTION COST INDEX U. S. average, including materials and labor, for 1926 - 1929 equals 100.

ATLANTA



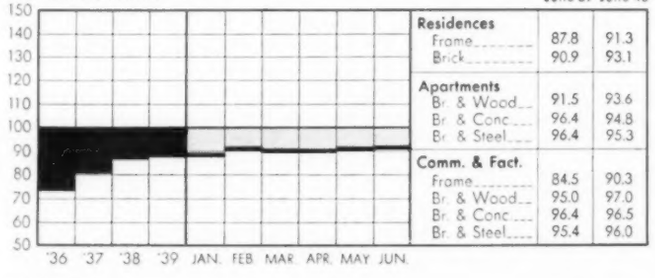
	June'39	June'40
Residences		
Frame	83.7	87.0
Brick	86.8	89.5
Apartments		
Br. & Wood	87.0	98.7
Br. & Conc.	95.4	96.7
Br. & Steel	95.5	97.2
Comm. & Fact.		
Frame	81.6	84.9
Br. & Wood	89.2	90.9
Br. & Conc.	97.6	98.3
Br. & Steel	95.7	97.1

BALTIMORE



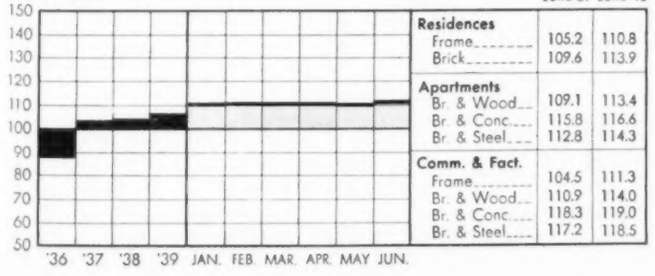
	June'39	June'40
Residences		
Frame	93.2	99.2
Brick	95.0	100.8
Apartments		
Br. & Wood	95.4	101.5
Br. & Conc.	99.7	102.3
Br. & Steel	99.1	102.7
Comm. & Fact.		
Frame	93.7	99.6
Br. & Wood	96.7	102.9
Br. & Conc.	100.9	102.9
Br. & Steel	102.0	105.7

BIRMINGHAM



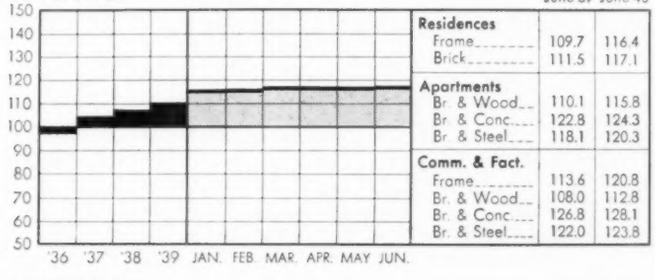
	June'39	June'40
Residences		
Frame	87.8	91.3
Brick	90.9	93.1
Apartments		
Br. & Wood	91.5	93.6
Br. & Conc.	96.4	94.8
Br. & Steel	96.4	95.3
Comm. & Fact.		
Frame	84.5	90.3
Br. & Wood	95.0	97.0
Br. & Conc.	96.4	96.5
Br. & Steel	95.4	96.0

BOSTON



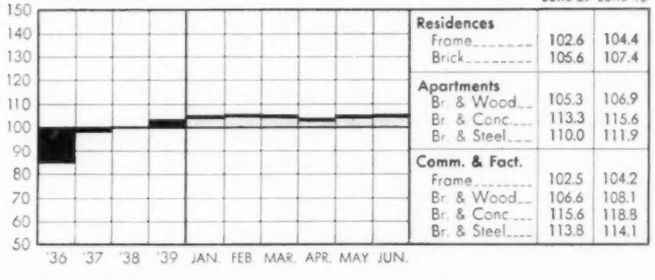
	June'39	June'40
Residences		
Frame	105.2	110.8
Brick	109.6	113.9
Apartments		
Br. & Wood	109.1	113.4
Br. & Conc.	115.8	116.6
Br. & Steel	112.8	114.3
Comm. & Fact.		
Frame	104.5	111.3
Br. & Wood	110.9	114.0
Br. & Conc.	118.3	119.0
Br. & Steel	117.2	118.5

CHICAGO



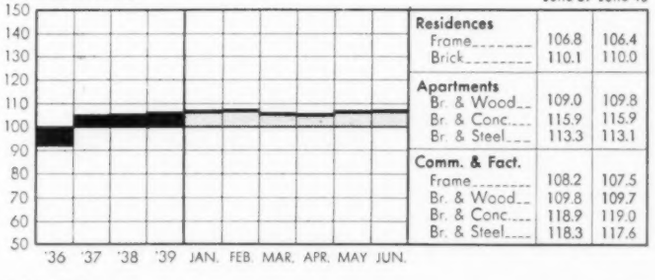
	June'39	June'40
Residences		
Frame	109.7	116.4
Brick	111.5	117.1
Apartments		
Br. & Wood	110.1	115.8
Br. & Conc.	122.8	124.3
Br. & Steel	118.1	120.3
Comm. & Fact.		
Frame	113.6	120.8
Br. & Wood	108.0	112.8
Br. & Conc.	126.8	128.1
Br. & Steel	122.0	123.8

CINCINNATI



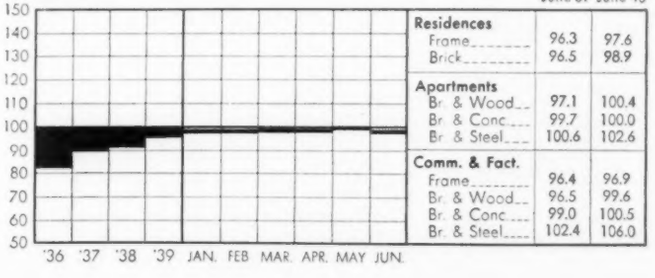
	June'39	June'40
Residences		
Frame	102.6	104.4
Brick	105.6	107.4
Apartments		
Br. & Wood	105.3	106.9
Br. & Conc.	113.3	115.6
Br. & Steel	110.0	111.9
Comm. & Fact.		
Frame	102.5	104.2
Br. & Wood	106.6	108.1
Br. & Conc.	115.6	118.8
Br. & Steel	113.8	114.1

CLEVELAND



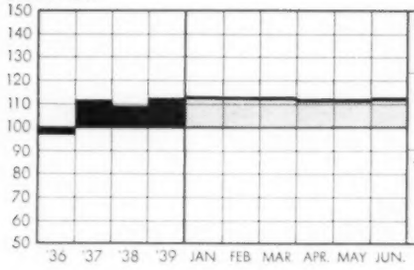
	June'39	June'40
Residences		
Frame	106.8	106.4
Brick	110.1	110.0
Apartments		
Br. & Wood	109.0	109.8
Br. & Conc.	115.9	115.9
Br. & Steel	113.3	113.1
Comm. & Fact.		
Frame	108.2	107.5
Br. & Wood	109.8	109.7
Br. & Conc.	118.9	119.0
Br. & Steel	118.3	117.6

DALLAS



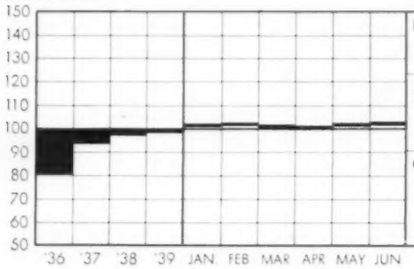
	June'39	June'40
Residences		
Frame	96.3	97.6
Brick	96.5	98.9
Apartments		
Br. & Wood	97.1	100.4
Br. & Conc.	99.7	100.0
Br. & Steel	100.6	102.6
Comm. & Fact.		
Frame	96.4	96.9
Br. & Wood	96.5	99.6
Br. & Conc.	99.0	100.5
Br. & Steel	102.4	106.0

DENVER



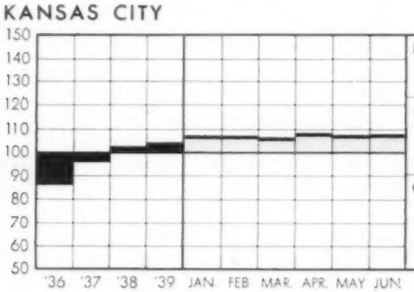
	June'39	June'40
Residences		
Frame	111.0	112.2
Brick	110.7	113.0
Apartments		
Br. & Wood	109.9	112.4
Br. & Conc.	115.2	117.4
Br. & Steel	113.8	115.4
Comm. & Fact.		
Frame	113.3	113.9
Br. & Wood	108.3	112.2
Br. & Conc.	116.6	119.7
Br. & Steel	116.3	118.7

DETROIT



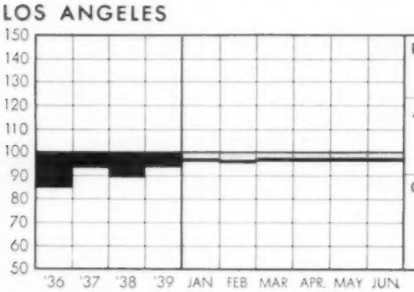
	June'39	June'40
Residences		
Frame	99.1	102.0
Brick	102.7	105.1
Apartments		
Br. & Wood	103.0	105.3
Br. & Conc.	108.1	108.9
Br. & Steel	107.3	108.1
Comm. & Fact.		
Frame	98.9	102.1
Br. & Wood	104.1	105.8
Br. & Conc.	109.3	110.4
Br. & Steel	111.0	111.0

KANSAS CITY



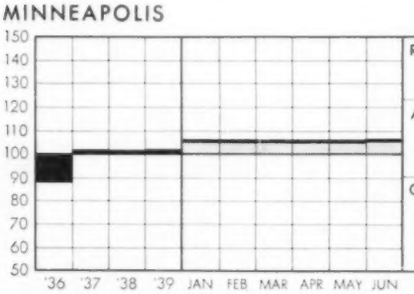
	June'39	June'40
Residences		
Frame	104.0	107.6
Brick	109.5	112.4
Apartments		
Br. & Wood	109.3	112.2
Br. & Conc.	118.1	118.8
Br. & Steel	115.2	116.3
Comm. & Fact.		
Frame	103.0	107.1
Br. & Wood	112.7	114.6
Br. & Conc.	121.5	122.0
Br. & Steel	120.1	120.6

LOS ANGELES



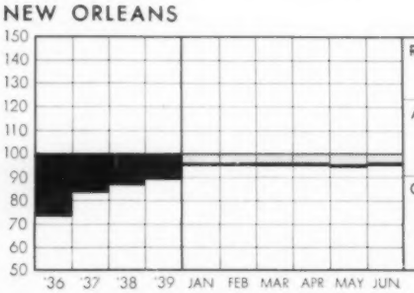
	June'39	June'40
Residences		
Frame	90.7	96.9
Brick	96.3	98.4
Apartments		
Br. & Wood	96.6	98.7
Br. & Conc.	102.9	104.4
Br. & Steel	104.3	105.8
Comm. & Fact.		
Frame	95.1	96.6
Br. & Wood	96.0	97.9
Br. & Conc.	103.7	105.8
Br. & Steel	105.4	106.9

MINNEAPOLIS



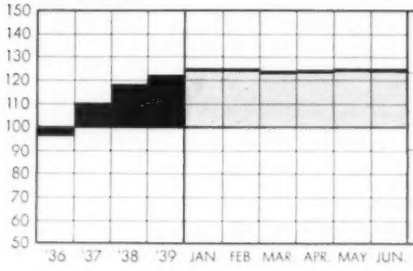
	June'39	June'40
Residences		
Frame	101.6	105.6
Brick	104.8	107.8
Apartments		
Br. & Wood	104.0	107.1
Br. & Conc.	113.6	113.8
Br. & Steel	110.7	111.7
Comm. & Fact.		
Frame	102.3	107.1
Br. & Wood	103.5	105.6
Br. & Conc.	117.2	117.5
Br. & Steel	114.5	115.5

NEW ORLEANS



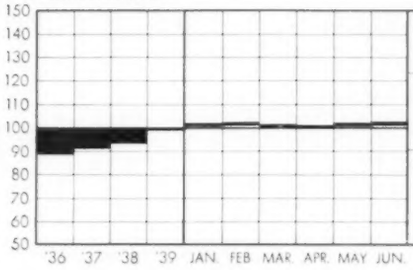
	June'39	June'40
Residences		
Frame	88.6	95.7
Brick	90.4	95.7
Apartments		
Br. & Wood	91.3	96.6
Br. & Conc.	96.0	98.9
Br. & Steel	98.6	101.3
Comm. & Fact		
Frame	87.8	95.4
Br. & Wood	91.8	96.5
Br. & Conc.	96.1	97.1
Br. & Steel	99.1	100.2

NEW YORK



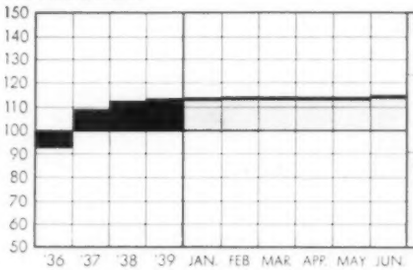
	June'39	June'40
Residences		
Frame	121.9	124.4
Brick	123.1	125.9
Apartments		
Br. & Wood	122.3	125.1
Br. & Conc.	130.6	131.9
Br. & Steel	125.9	127.3
Comm. & Fact.		
Frame	125.2	127.5
Br. & Wood	119.4	122.6
Br. & Conc.	133.4	134.6
Br. & Steel	129.9	131.3

PHILADELPHIA



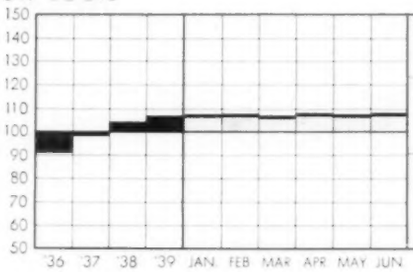
	June'39	June'40
Residences		
Frame	98.0	101.6
Brick	101.5	104.4
Apartments		
Br. & Wood	102.0	105.0
Br. & Conc.	105.5	106.5
Br. & Steel	104.2	105.7
Comm. & Fact.		
Frame	96.4	100.5
Br. & Wood	104.6	106.6
Br. & Conc.	106.7	107.4
Br. & Steel	105.8	107.6

PITTSBURGH



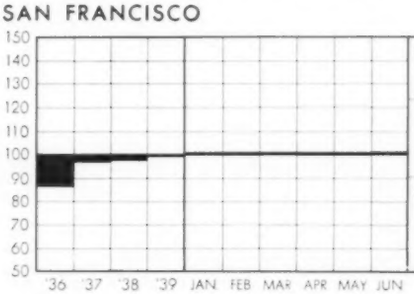
	June'39	June'40
Residences		
Frame	113.8	114.6
Brick	117.3	117.0
Apartments		
Br. & Wood	115.6	116.4
Br. & Conc.	117.5	117.6
Br. & Steel	114.2	114.3
Comm. & Fact.		
Frame	114.1	115.1
Br. & Wood	116.4	117.2
Br. & Conc.	119.1	119.3
Br. & Steel	117.2	116.1

ST. LOUIS



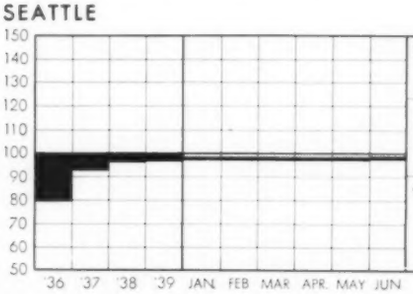
	June'39	June'40
Residences		
Frame	106.8	107.8
Brick	110.0	110.8
Apartments		
Br. & Wood	109.7	110.5
Br. & Conc.	118.5	118.9
Br. & Steel	116.1	116.7
Comm. & Fact.		
Frame	107.1	108.2
Br. & Wood	110.1	110.8
Br. & Conc.	119.7	120.4
Br. & Steel	118.5	119.1

SAN FRANCISCO



	June'39	June'40
Residences		
Frame	98.7	100.5
Brick	104.7	106.2
Apartments		
Br. & Wood	104.3	105.7
Br. & Conc.	116.9	117.2
Br. & Steel	113.6	114.0
Comm. & Fact.		
Frame	97.1	99.1
Br. & Wood	107.2	108.2
Br. & Conc.	121.3	121.9
Br. & Steel	114.7	115.3

SEATTLE



	June'39	June'40
Residences		
Frame	96.0	98.4
Brick	103.8	105.7
Apartments		
Br. & Wood	103.1	105.0
Br. & Conc.	118.5	119.0
Br. & Steel	114.1	115.0
Comm. & Fact.		
Frame	93.7	96.4
Br. & Wood	107.8	109.1
Br. & Conc.	124.5	124.9
Br. & Steel	117.0	117.6

REVIEWS OF CURRENT BOOKS

From "Portrait of a Colonial City"

PORTRAIT OF A COLONIAL CITY: Philadelphia, 1670–1838. By Harold Donaldson Eberlein and Cortlandt Van Dyke Hubbard. J. B. Lippincott Company, Philadelphia, 1939. 580 pages. 252 halftone illustrations and 2 maps. Price, $15.00.

IN THEIR *Portrait of a Colonial City*, the authors have assigned themselves the task of presenting a picture of the Philadelphia of Colonial times by means of telling the story of historic houses still standing today in the city and its environs. These houses are described from both their physical and historical aspects, the latter including an account of the lives of individuals or families identified with the dwellings, insofar as these people enter into the story of the houses themselves.

The work spans, in the three parts into which it is divided, that period in the growth of the city of Philadelphia which has been called "eighteenth-century London in miniature." The first part, "As It Was In The Beginning" (before 1730), sees the coming of the Quakers from England, who build, in their adopted city, in conformity with the style of the London they have left—the reconstructed London of Wren after the Great Fire. In the second part, to which the authors give the title of "Sturdy Youth" (1730-1783), the city displays a steady vigorous growth, while retaining its essentially English appearance. As Thomas Pownall writes, in 1755, "The houses are all of brick: the fronts of them precisely as those in Cheapside, London. . . ." In the third period, that of "The Golden Age" (1783-1837), Philadelphia reached, in the opinion of the authors, "the most perfect and unblemished physical distinction and beauty it has ever known in all its history."

Each of the three parts of the book is preceded by an introduction describing the physical and social characteristics of the city in the respective periods considered — the outstanding public buildings, markets, shops, inns and taverns, events of importance, and the daily life of the time. Individual chapters are devoted to some 70 historic houses, most of which are pictured by several photographs, while other buildings are briefly mentioned.

It may be observed that in the very composition of this *Portrait of a Colonial City*, the work does not attain the wholeness of a portrait. However, the authors have succeeded in affording the reader many fascinating glimpses of Colonial Philadelphia. They have wisely introduced into their text many quotations from documents of the time, all of which revivify the period.

CHOOSING A MODERN HOUSE. By R. Myerscough-Walker. The Studio, Ltd. London, 1939. 96 pages. Illustrated. Price, $2.50.

AS SUGGESTED by the title, this is a work whose appeal is directed at the would-be house owner or builder.

Mr. Myerscough-Walker, as architect, places himself imaginatively before a client who poses numerous questions:

What should the "modern" house offer me? What sort of a site should I choose? Is there any rough guide to costs? What are the advantages and disadvantages of a flat roof? What are the improvements in heating, lighting, and sanitation? Et cetera.

Many of these questions are directly answered in the introduction, while the answers to others appear in the text accompanying the illustrations throughout the book. The introductory pages also serve as a statement of such essential principles as might be of interest to the layman, concerning both contemporary architecture as a whole and its specific identification with houses.

More than 200 illustrations and plans of modern houses in many of the countries of Europe, as well as in this country, comprise the body of the book. These houses, all designed by prominent architects who have won recognition from the world, show great variety in style, ranging from more traditional types, in the first part of the book, to the achievements of such leaders in the architecture of our time as Alvar Aalto, Le Corbusier, and Frank Lloyd Wright.

The illustrations, all clearly reproduced, serve as visual responses to many questions which the layman might ask. As a whole, the work is commendable as an effort toward the popularization of its subject.

HEATING, VENTILATING, AIR-CONDITIONING GUIDE FOR 1940. Vol. 18. American Society of Heating and Ventilating Engineers. New York, 1940. 1088 pages, plus Roll of Membership. Illustrated. Price, $5.00.

IN ANSWER to popular request, this new edition of the *Heating, Ventilating, and Air-Conditioning Guide* has been reduced in size and weight, without curtailing the amount of information contained in previous editions.

Since the first edition in 1922, there has been a great growth in both the Technical and Catalogue Sections. To reverse this trend toward increasing bulk and to make a handier volume, repetitious material has been removed and a somewhat thinner paper used.

Certain chapters have been rewritten, or at least partially revised. A new Chapter 23 has been written for Unit Air Conditioners, Cooling Units, and Attic Fans. The chapter on Heat Transmission Coefficients and Tables has been checked to eliminate obsolete products and to include new ones, where authoritative data are available.

Other revisions make this edition up-to-date and more useful.

National Defense Program Spurs

NEW DEMANDS FOR IMMEDIATE CONSTRUCTION

By Thomas S. Holden

WHAT EFFECTS will the execution of our present defense program have upon building in general and the profession of architecture in particular? What new demands upon our entire building industry are latent or implied at the present time? Will the current forward surge of private building activity be arrested because of the urgency of government demands, because of rising prices, or because of the jittery state of mind of investors great and small?

Definite answers to such broad, far-reaching questions are, of course, outside the scope of any man's capacity. Important as they are to every architect and engineer in the country, both questions and answers hinge upon the great and imponderable events that reflect a world in which seething forces make cataclysmic changes the order of the day.

It is possible, however, to consider certain phases of our immediate situation; and project not a forecast, but a survey of facts and observations which may serve as a background for calm and reasoned judgments in a time of great confusion.

First, how can the significance of our nation's defense program be appraised in terms of its logical effects upon our national economy?

For the next year—probably for the next three to five years—we shall undoubtedly be spending not less than five billion dollars annually to build ships, to manufacture munitions, to build and equip an army adequate for defense in this hemisphere. We face the possibility, if not the probability, of compulsory military training involving millions of individuals. We also face a financial problem so vast that the threat of inflation is certain to increase.

Increased production of basic capital goods automatically stimulates employment and multiplies the turnover of money at a greater rate than in any other division of our economy. As the wheels of heavy industry turn faster and faster, as needs for plant additions become felt, we may expect an immediate result to be creation of much new employment of money and men. And, because a defense force needs clothing as well as cannon, light industry will be affected as well as heavy industry. Altogether, it is likely that 10,000 industrial enterprises will be directly stimulated by our defense program activity.

Simultaneously there exists the strong probability that agriculture will be quite as directly affected. Demands upon our farmers are likely to intensify to such a degree that instead of killing off little pigs, their major problem for an indefinite period may be to make two little pigs grow where one grew before.

More Americans are going to have jobs; more Americans are going to have more money to spend; and throughout the land more merchants are going to have more customers in more stores.

Second, how, specifically, would such a course of events affect building and opportunities for service by architects and engineers?

New plants for the production of essential materials such as synthetic rubber, smokeless powder, certain alloys, and machine tools now seem necessary. Demands upon our mechanical industries are likely to force a general plant expansion. The adequacy of our power supply is being questioned—new peak loads may well thrust forward a building program to provide more generally available electricity.

In many existing plants a production step-up to a three-shift operation seems likely. Additional employees for such plants and those necessary to operate new plants in isolated communities must be adequately housed. As we develop various phases of our new activities, shelter of many kinds in many localities is inevitably indicated.

So it can be reasonably assumed that the nation's program is likely to stimulate directly a building program involving, probably:

(a) miscellaneous construction for the army and navy;
(b) new housing for vastly increased army and navy forces;
(c) new production facilities;
(d) new housing for industrial workers.

Paralleling activity of these kinds, private investment in homes and other buildings may conceivably be stimulated, partly because of a sense of increasing business prosperity and partly because of a desire to hedge against the possibility of subsequent inflation.

Third, under what terms will those buildings which the army and navy and the Defense Advisory Commission say are necessary be constructed?

Currently there is basis for the belief that financing of new plants and existing plant extension will be through government loans, made in some instances by RFC. The Defense Advisory Commission is apparently disposed to encourage production in privately owned and operated—rather than government-owned and operated—plants. It follows that building operations necessary to forward the industrial part of the nation's defense program will be largely in private hands as in normal times.

Construction for the army and navy will probably involve the least decentralization of authority; and it seems likely that most of the work will be done by the regular bureaus of these two services. Accommodations for unmarried personnel and civilian service will obviously be included in projects of these two departments. But a new

Backed by aroused public opinion and a record-breaking appropriation, the Defense Advisory Commission is making rapid headway in developing a nationwide program of preparedness—a program that, to some degree, will necessarily affect nearly every phase of our social and economic life. Already it has touched a number of important industries. What will be its effect on building? — This article, by the RECORD's Editorial Director, surveys some factors in the present situation that may suggest an answer. It is based in part upon analysis of current statistics and in part also upon recent conversations with men prominent in government and in the construction industry.

housing need has recently been pushed to the front—decent accommodations adjoining army posts and navy bases for families of married enlisted men. The USHA has recently approved two projects of this sort at Pensacola and Montgomery, as regular slum-clearance projects. It is reported that Congress will be asked to make a special appropriation to carry on more projects in this category.

Closely akin to this type of housing is provision for industrial workers which because of its character cannot economically be undertaken by private financing. It may be expected that local housing authorities will shortly conduct studies in various localities to ascertain needs, the available supply, and the amount of industrial housing that can be supplied by private enterprise. Where financing on a 20-year amortization basis cannot meet the demand, and in cases where workers are to be only temporary additions to a community, it seems probable that government-owned or financed housing will be built.

Broadly speaking, evidence to date indicates that Washington authorities intend to develop various phases of our defense program by avoiding creation of new emergency bureaus and by employing existing public and private agencies in every possible case.

For example, where government financing for housing is indicated, it is believed that facilities of USHA and of local housing authorities will be used and the current practice of employing private architects, engineers, and contractors continued.

The construction directly involved in the defense program plus the likelihood that the program will increase the national income, and the added probability that real property may be increasingly regarded as a relatively safe and favorable investment, can well result in a strong continuation of the present up-curve in building. Up to mid-June, according to F. W. Dodge records covering 37 states, the volume-rate of private contracts has not diminished. On the contrary, private construction has continued to increase without interruption since the German army invaded the Low Countries. No tendency toward rising building costs is yet evident; and none seems likely for some time ahead. Thus the three factors that might curtail private construction operations in this emergency period—panic on the part of investors, increasing government restrictions, and rising costs —do not seem likely to appear in the near future. On the basis of currently known facts, therefore, rising volumes of both private and public building work can be expected in the coming months.

Just as industry is rallying its production resources to meet the critical needs of the present emergency, so architects and engineers are rallying their resources to the end that they may be utilized most effectively. A nationwide census of 115,000 architects and engineers skilled in the design and supervision of all types of construction needed is under way, under the joint sponsorship of the AIA and the American Society of Civil Engineers. Stephen F. Voorhees is heading this activity for architects; John P. Hogan is acting similarly for engineers.

The listing of 15,000 architects at the home of the American Institute of Architects, The Octagon, Washington, D. C., and of 100,000 engineers at the Headquarters of the American Society of Civil Engineers, 33 West 39th Street, New York City, will be carried out in three steps. Each man or office will be classified as to skill in the design and supervision of airport construction; housing facilities; water supply and purification plants; disposal systems, roads, and tunnels; industrial plants; in shipping, involving docks, warehouses, and railroads; and in military cantonments with barracks, all of which involve many mechanical, refrigerating, heating, and ventilating accessories.

The first step of the census, just started, is the listing of engineering and architectural firms, partnerships, and individuals in private practice to provide nearly 100% coverage. The second step will consist in indexing and classifying each firm or individual according to qualifications. The final step will be similar to the first two but will list and classify individual architects, engineers, draftsmen, surveyors, and specialists, relative to their ability to work with firms.

This census properly recognizes the principle of avoiding the dislocation of architects or engineers now engaged in industry, utilities, and governmental services. This will insure existing organizations against the possibility of being crippled by the needless replacement of valuable men who would be essential in case of national emergency. Account will be taken also of those in the National Guard or Reserve Corps.

Industry leaders have made strong representations in Washington to the effect that the most practical coordination of construction functions is that which takes place in developing a specific project for a specific purpose at a specific site, where ample authority and ample funds are given to the project boss. With the growth of professional and trade associations that has taken place in the past 20 years, and with the recorded experience of the NRA effort, far readier means exist today than in 1917 for calling forth the resources of the industry for a construction project of any kind or size.

CALIFORNIA LOOKS AT HOUSING

State Planning Board recommends FHA continuance; stresses slum clearance and public housing needs

FOR MORE THAN A YEAR the California State Planning Board has been conducting a broad study of the governmental agencies concerned with private and public housing.

Last month, the Board submitted to Governor Culbert L. Olson the first report of its findings and recommendations. The survey dealt, of course, with California's particular problems; nevertheless, it has a scope broad enough to be applicable, in part at least, to any state suffering from slum conditions.

First attacking the difficulties confronting an expansion in private housing, the Board suggested a reorganization of the Division of Immigration and Housing, to eliminate red tape. It recommended that this agency co-operate more fully with other housing organizations through planning and research; aggressively stop State Housing Act violations; and discover why so much of the legislation designed to aid private housing and supposedly in force is not functioning.

In short, the Board feels that the state housing machinery needs a service check-up. Its general design is satisfactory as it stands, but it needs better timing and executive lubrication to set it in more effective motion.

Meanwhile, the report has a good word for Federal agencies concerned with private housing. It advises the FHA to continue its fine work but hopes it will redouble its efforts towards decreasing the cost of home construction and interesting private capital in slum clearance. In connection with the former, the U. S. Department of Justice is called upon to continue investigating monopolistic practices in the building industry.

Local governments are advised to work out decent zoning laws and then enforce them; also, constantly to review inequalities in tax evaluations which operate against home owners. Petty faults in city and county administration are no mean factors in retarding building development.

Concerning public housing the Board has this to say: "The problems involved in the operation of a sound housing program for the underprivileged, especially in rural areas, are so complex as to indicate the need of a state agency properly equipped and financed to perform such functions as: . . . conducting research . . . providing for the systematic elimination of substandard houses . . . facilitating the use of tax-deeded lands . . . building low-rent projects where no local authorities exist . . . aiding local authorities in the development of their programs."

Such a plan for state-wide coordination, the Board feels, is the only method that can bring low-rent housing out of the limbo of confusion in which it now stands and substitute a comprehensive long-term slum-clearance program.

Searching for methods of stretching every dollar spent on public housing farther than has hitherto been possible, the report made three interesting suggestions: (1) that the USHA give local authorities more freedom in bringing urban housing into conformity with sectional, climatic, and cultural conditions by permitting single family units, and then making it possible for the tenant ultimately to purchase his home; (2) that the State Relief Administration and the WPA revise their policies to provide relief labor and equipment for housing projects sponsored by local agencies; (3) that the Civilian Conservation Corps supply lumber for the low-rent housing projects.

In closing the report, two last suggestions were made for the purpose of activating slum clearance. They were that the FHA offer financial aid to local housing authorities seeking private capital, and that, in the opinion of the California State Planning Board, the local housing agencies are *not* taking full advantage of the opportunities already being offered them.

MORTGAGE MONEY PLENTIFUL

Loan volume is up; interest trend is lower

BREAKING RECORDS right and left, the savings, building, and loan associations had in April their first $100,000,000 month in loan activity since the depression, lending an estimated $108,000,000.

According to the mortgage-loan index of the Federal Home Loan Bank Board, the associations did 32.5% of all April home financing as compared with 30.2% last year. The total volume included $33,764,000 for new home construction, $37,821,000 for assistance in home buying, and $6,097,000 for repair and modernization.

A larger than seasonal rise of 19.5% over March lending activity was registered, while the increase over April 1939 was even more spectacular at 29.4%.

Meanwhile, private lending agencies are apparently viewing this increase in their mortgage financing and suggesting that, all things considered, now is the time for the Government definitely to fold up the HOLC and FHA. The National Association of Mutual Savings Banks has taken a particularly strong stand on these points. Its spokesman, Bernard F. Hogan, Chairman of the Committee on Mortgages, has reminded the bankers that the HOLC is already in liquidation and that evidently there is no intention to perpetuate this institution longer than necessary.

In the case of the FHA, Mr. Hogan says, probabilities are less evident. The original law provided that the total mortgage obligations which could be insured by the FHA and outstanding at one time under the Act must not exceed $2,000,000,000. This total, however, has since been increased to a maximum of $4,000,000,000 of insured mortgages. To date, private lending institutions have placed mortgages carrying FHA insurance almost to that maximum. Further aggressive lending by private institutions will do as much or more than any other method to offset the influence of insurance by Governmental agencies.

Also, the banking interests hope that recovery will proceed sufficiently in the near future to enable mortgage borrowers to take commitments for the purchase of homes without the necessity of insurance by Federal agencies, since they hold that investment of private capital without Government sponsorship

(*Continued on page* 108)

St. Thomas

HOTELS

Statistics indicate substantial increases in hotel building in 37 eastern states, according to F. W. Dodge. Figures show that, in 1939, projects totaled nearly 2½ million square feet in area, at a cost of over 8½ million dollars. This roughly doubles 1938 figures. For the first quarter of 1940, data show an even greater increase over 1939's first quarter. These figures do not include tourist courts, which constitute a new type of hotel accommodation. . . . Flexibility of design is essential in modern hotel planning. Plans are best prepared on the basis of surveys made by those who will be charged with hotel operation, including manager, chef-steward, housekeeper, and engineer, to obviate failures due to arbitrary design and construction. Every detail has a direct bearing on operating costs; and the design problem has changed substantially in recent years. . . . In the following pages, discussions, Time-Saver Standards, and Case Studies relate these requirements to transient, apartment, resort, and tourist hotels.

St. Thomas

New Demands and Technical Advances
ARE CHANGING HOTELS

The hotel operator realizes, as few others do, how hotel planning is affected by the changing habits of his clientele, and by technical advances in construction and equipment. MOLLY N. SIPOS, formerly Service Editor of *Hotel Management*, has prepared the following discussion of new standards. Notable contributions have been made by W. S. WOODFILL, Chairman, *Resort Hotels Committee, American Hotels Association*; J. O. DAHL, Editorial Director, *Hotel Management*; the architectural firm of GEO. B. POST and SONS; and many hotel operators.

TRANSIENT HOTELS

The transient hotel almost invariably has an expensive site and high operating expense. So modern planning must have as its first objective the offsetting of these costs in every possible way. Economy in the use of space is one means of increasing the productivity of hotel areas. Modern methods of handling light, sound, and ventilation may increase the revenue-producing power of space, or convert dead areas into live ones. Careful planning can reduce costs of operation, make reconditioning less frequent, and add to the productive life of the enterprise.

Useful life of a hotel building ranges from 30 to 50 years. The structure as originally planned must be up-to-the-minute, yet the building must be adapted to future modernization.

Preliminary survey: The size of the hotel and the extent and type of facilities to be provided will depend upon local conditions and the volume and nature of business in prospect. Studies embracing a number of representative hotels now in successful operation disclose wide variations in space arrangement. This emphasizes the need for a detailed study of the individual project. Some of the more important factors are:

(a) Character of town selected (whether urban, suburban, or rural; if not strictly urban, whether it is a county seat, transportation center, trade center, etc.);
(b) Climatic conditions;
(c) Spending habits of the populace in the given section;
(d) Demand for transient and residential business (whether commercial or family trade, length of stay, etc.);
(e) Estimated demand for space for sales meetings, banquets, dances, conventions, etc.;
(f) Price ranges, competition, and other conditions inherent in the locality;
(g) Estimated future growth of the business.

Guest rooms: There are few strictly transient hotels; most such establishments have some residential facilities. There is little demand today for rooms without baths.

One maid can usually take care of 18 to 20 guest rooms, if they are on one floor. Approximate room sizes for transient hotels are tabulated on page 87.

Guest-room equipment: Space can be saved in guest rooms without detracting from their comfort and appearance, by the use of specially designed built-in furniture. The trend is toward more livable hotel rooms, however, as well as saving of space, and this may be achieved by the use of combination furniture, so designed that one unit may be used for two or more purposes. Studio beds are now commonly used in parlor-bedrooms and in suite living rooms.

Average stays in transient hotels are from 1½ to 2 days. Guests do not carry much luggage; hence small closets, perhaps 22 by 24 in. for single rooms, are adequate.

Rooms can now be placed adjacent to noisy areas because sound transmission and reverberation can be controlled Dark areas may be lightened and electric wattage (for lighting) reduced by the use of such materials as structural glass, light-diffusing and reflecting paints, linoleum and coated wall coverings, mirrors and plastics, indirect and fluorescent lighting systems, and similar means. If the building is air-conditioned, ceiling heights may be lowered, thus eliminating cubage formerly required for comfort.

Housekeeping and service: These facilities are usually located near stairways and at ends of corridors, connecting readily with service halls and elevators, linen and storage rooms, chutes, etc.

Public spaces: As a general rule, public spaces and private dining rooms are located on lower floors, easily accessible to entrances, elevators, and main thoroughfares. Adequate elevator service is required directly to and from these areas to avoid traffic congestion. Local fire and building regulations usually govern. In smaller hotels it may be desirable to keep all public spaces within short walking distance of the main floor and entrance. Checking facilities must be provided within easy reach of all public spaces. Toilets and rest rooms must also be available.

Lobbies, kitchens, and dining rooms should be located and arranged to avoid cross traffic, not only by the public but also by employees.

The formal dining room of the past is no longer profitable. The trend is toward one room for all public dining purposes; this may be called a "coffee shop" and may have counter service; in any case the atmosphere is informal. Direct access to the street as well as to the lobby is necessary. Twelve to fourteen square feet per person is the usual seating allowance. Layout of the room requires the advice of a practical restaurant man.

Kitchen: All food service, storage, and preparation is preferably centralized. Dishwashing is preferably taken care of in the basement, with subveyors to the

PUBLIC AND SERVICE SPACES

Not all of these are required in every hotel. Selection of type required, and determination of exact areas and dimensions, depend upon local factors revealed by preliminary surveys.

HOUSEKEEPING, MAINTENANCE
- Service halls
- Service elevators
- Service chutes
- Service sinks
- Service cleaning and supply closets
- Storage rooms:
  - Linen and blankets
  - Guest room—extra furniture, beds, accessories
  - Housekeeper's supplies
- Housekeeper's office
- Sewing room
- Laundry
- Shops and storage for:
  - Carpenters
  - Upholsterers
  - Electricians
  - Plumbers
  - Painters
  - Drapery hangers
  - Window washers
  - Housemen's supplies

Help's quarters:
- Women's lockers and washrooms
- Men's lockers and washrooms

ENGINEERING DEPT.
- Engine and boiler rooms:
  - Boiler plant
  - Central refrigeration plant
  - Air-conditioning units
  - Air compressors
  - Water heaters
  - Electric switchboard
  - Ventilating equipment
- Storage:
  - Fuel, equipment, and supplies
- Help's lockers and washrooms
- Engineer's office

MANAGING, CONTROLLING DEPTS.
- Executive private offices
- Comptroller's offices
- Cashier's offices
- Clerk's offices:
  - Timekeepers
  - Auditors
  - Receiving
  - Storeroom
- Intercommunicating department
- Advertising and publicity departments
- Stationery, printing, and supply rooms

PUBLIC SPACES
- Front office
- Lobbies
- Lounges:
  - Writing room
  - Library
  - Card and game rooms
  - Music rooms
- Gymnasium
- Swimming pool
- Corridors
- Stairways
- Elevators
- Mail room
- Check room
- Package and trunk room
- Porters' desk
- Bank storage vault
- Women's public toilets and lounge
- Men's public toilets

FOOD SERVICE, PREPARATION; FUNCTIONAL ROOMS
- Main dining room
  - Dance floor and orchestra space
- Informal dining room
- Grill room or coffee shop with counter service
- Cafeteria
- Private dining rooms
- Cocktail cafe, lounge, and bar
- Room service
- Banquet and convention halls
- Ballrooms
- Club rooms
- Check room, lounges and toilets
- Main kitchen:
  - Food service section
  - Food preparation section
  - Food storage and refrigeration for day's use
  - Ranges, steam tables, and equipment section
  - Dish and silver washing and storage
  - Glass washing and storage
  - Linen storage
- Banquet service pantry
- Main storage and refrigerators:
  - Beverage
  - Food: groceries, canned goods, meats, vegetables, dairy
- Food checkers' section
- Garbage room and incinerators
- Steward's offices

Help's facilities:
- Dining room
- Lockers
- Washrooms

CONCESSIONS, SUBLEASES
- Barber
- Beauty parlor
- News and cigar stand
- Telephones
- Theater tickets, travel bureau, and telegraph
- Valet and laundry
- Haberdasher
- Women's wear shop
- Gift shop
- Florist
- Drug store and soda fountain
- Doctor's office
- Dentist
- Public stenographer & notary public
- Broker's office
- Other offices and shops
- Garage

kitchens and dining rooms. Special care must be taken to insure that the space provided for this purpose is "soundproofed" and adequately ventilated.

Employees: Many hotels have discontinued the feeding of employees with the exception of those directly employed in food service. A separate room must be provided for this purpose; if a considerable number of colored as well as white employees are to be fed, it will be necessary to have two rooms, preferably in the basement, connected to the kitchen by a dumb-waiter.

Laundry: Most hotels over 100 rooms in size can afford to operate a laundry sufficient for their own needs. If the hotel is over 400 or 500 rooms, it can usually afford to do guests' work as well.

Concessions: Most desirable are barber shop, cigar and news stand, beauty parlor, and drug store. The beauty parlor is usually on the mezzanine, the barber shop in the basement close to the public toilet, the news stand in the lobby, and the drug store on the main floor.

RESIDENTIAL HOTELS

These are usually located in densely populated sections of cities, and are built for guests who wish the permanence and privacy of a residence together with the service of a hotel. They differ from the transient hotel in that some types provide housekeeping facilities and more suites; rooms and bathrooms must be larger, and closets must be large enough to accommodate complete wardrobes and other necessities; less public space is needed.

Some of the distinctive types are:

(1) Apartments with food-service facilities but no housekeeping provisions.
(2) Apartments with food-service and semi-housekeeping facilities.
(3) Apartments with both food-service and full housekeeping facilities.

Those with full housekeeping facilities are usually used by family groups. Among the nonhousekeeping types is the *bachelor hotel*, which is mainly used by single men or women who desire the comforts of the home-like atmosphere in addition to hotel accommodations and services. These are usually designed to meet specific ranges of income and may be compared somewhat to a college dormitory.

Where food service is provided, a popular-priced dining room is preferred; tea rooms are the most common type. Some apartment hotels provide a service kitchen on each or every other floor; others provide kitchenettes for light meals or just breakfast in each apartment. However, the majority of hotel guests usually eat in restaurants; statistics show that in New York City 46% of all meals are eaten outside the home.

RESORT HOTELS

Business of most of these hotels is seasonal, for, at most, six- to eight-week periods. Therefore, location with low taxes and maintenance costs is essential, and construction must be inexpensive, yet durable and attractive. Because of the high rates necessary to make the short period profitable, such hotels must offer a maximum of conveniences and services, in a comfortable home-like atmosphere. Some resort hotels operate in all seasons. These tend to attract touring guests, who visit several hotels and spend only a few days at a time in each; such cases can be planned along almost the same lines as transient hotels.

Type and size: All resort hotels have to be laid out to conform with their surroundings, which ordinarily determine the architectural treatment. Degree of formality of the resort atmosphere directly affects the appearance of the structure. Buildings are preferably low and spread-out to give a feeling of spaciousness, and afford security from fire. Attractive landscaping is essential.

For profitable investment, experience shows that the resort hotel can contain as few as 50 rooms, but usually not less than 100, and flexible plans are necessary to accommodate future additions. If conventions are to be solicited (and many resorts go in for this business) a minimum size is 200 rooms. Very few large hotels are profitable; the usual maximum is about 300 rooms.

Recreation: Social activity and recreation facilities must be abundant, both indoors and outdoors. To insure quiet in the resort hotel proper, provisions should be included in the site plan for noisy recreational activities at a distance from the main building. It is desirable also to provide an ample number of special entrances to the main building from recreational facilities, so that guests who prefer lounges, verandas, and sun rooms will not be disturbed.

Rooms: Not more than 10% of the rooms need be single, and those which are preferably accommodate double beds. The remaining rooms should accommodate twin beds. There should be communicating rooms with soundproof doors between, capable of easy conver-

sion to parlor-sitting rooms or studio rooms. For this purpose furniture-storage rooms are required for parlor furniture. No sample rooms are needed. All guest rooms must be slightly larger than those in transient hotels, as, for the high rates charged, resort guests expect a maximum of comfort, conveniences, services, and quiet rooms. Soundproof walls between rooms and adequate natural ventilation are very essential. Windows, screened, should be large and low so people can sit near the windows and look at the view without effort.

Food service: Mr. W. S. Woodfill recommends that modern hotels should offer "European plan" food service, and not require guests to stay on the "American plan"; or that there should be available, in addition to the formal main dining room, an inexpensive, quick-service coffee shop and soda fountain; or, as suggested by Mr. J. O. Dahl, a casino, away from the hotel proper. Centralization of food service and food storage in one area is recommended.

Employees: Generally, the resort hotel has to provide room and board for all employees. The preferred plan is to locate service housing and feeding facilities away from the hotel proper. Guests' servants usually must also be provided for, and in the same manner, but separately, often in other hotels or rooming houses located in the vicinity.

Public spaces: The resort-hotel lobby must be more spacious than that of the transient hotel. In architectural treatment, it is quite different from the formal "commercial" lobby; guests occupy resort lobbies for longer periods and for rest. Public spaces must also be more numerous. These may include lounges with facilities for reading, music room with piano and radio, card room for bridge or other games, also, if appropriate, a dignified cocktail lounge, without a bar. Convention halls, with soundproof walls, for banquets, etc., are best located on the lobby floor and near the main kitchen for convenient food service. A check room near the dining-room entrance, convenient to the lobby, is required.

Concessions: Location of the resort hotel often demands maintenance of seasonal subrental stores which sell apparel, furnishings, sporting goods, souvenirs, drugs, etc.; but unless these can produce worthwhile revenue they ought to be avoided. Valet service, barber shop, beauty parlor, news and cigar stand are essential. It often is necessary to provide facilities for caring for the automobiles of guests. Requirements usually include not only space for storage and parking, but also for fuel, supplies, and repairs and adjustment.

MOTOR HOTELS

A modern variation of the hotel business, rapidly growing in popularity, is the "motor" hotel, with a front entrance for the automobile and its occupants and with accommodations for both.

These accommodations are known to the public under many names, such as auto, motor, and tourist hotels, motor courts, motels, etc. The type of inadequate accommodations which has sprung up all over the United States has not, until recent years, been a field into which the architect could profitably venture. But discernible standards are now evolving; and the unplanned, poorly built "tourist cabin" may shortly have to give way to the more continuously profitable type of development which results from coherent planning and reasonably good construction. Such organizations as the International Motor Court Association and the United Motor Courts, Incorporated, are attempting to replace "cabins" and "camps" with more satisfactory accommodations.

The International Association estimates that there are 5,000 first-class motor courts in the United States, Canada, and Mexico; 1,000 of them deluxe. A survey by the American Automobile Association, made public in their *Americans on the Highway*, shows that approximately $1,000,000,000 was spent last year by the traveling public; and *Tourist Court Journal* of Temple, Tex., estimated about $262,000,000 was spent in motor hotels, and that new courts are being built at the rate of 800 a year.

The motor hotel is patronized the year around, as the guests include vacationists during all seasons and a considerable number of business travelers. Locations are usually near main highways in low-cost rural sections.

Construction and layout: The structures are usually a series of detached cottages, or low rambling buildings, with a series of attached units having individual outside entrances, of one to three stories in height. The administration building is usually conspicuously located to control the main entrance. During the past three years about half of the existing motor hotels have found it necessary to construct additional units.

Construction is preferably of any inexpensive material; it should be attractive and durable. Materials used should be soundproof, insectproof, and fireproof, in addition to having insulating properties. There are isolated examples of experimentation with new, or local, materials and specialized equipment, such as bituminous adobe brick and special metal corner windows used in Norman Courts, Norman, Okla. The windows allow more wall space for comfortable furniture placement, and are designed to be closed from the outside by court employees during sudden rain storms, without disturbing the guests.

Guest rooms: Room sizes may be similar to or slightly larger than those recommended for transient hotels. The importance of air conditioning and heating is emphasized in newer hotels of this type. Single rooms preferably accommodate double beds, for either one or two occupants. Connecting bedrooms are popular in these hotels, as are suites of two or three rooms with studio beds in the living room. Furnishings of the transient-hotel type are appropriate. The trend is to individual bathrooms, preferably with shower stalls, for each guest room. Closets may be small as the tourist does not usually stay long.

Other facilities: Motor hotels differ from other hotels in that they do not have sample rooms, nor do they require provisions for entertainment, banquets, or functions; and no public spaces other than the office-building lounge, outside lawns, verandas, patios, etc., are needed.

Nearly half of the motor hotels provide food service in the form of coffee shops with counter service in or near their immediate property.

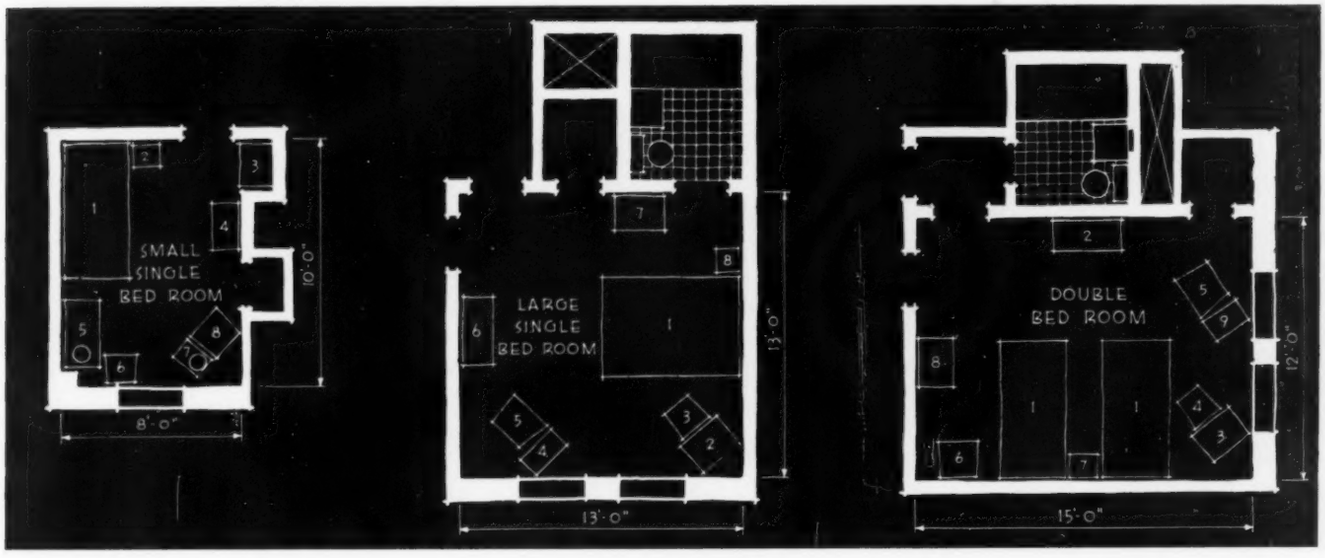
Hotel laundry is preferably taken care of by a local commercial laundry if one is available.

Landscaping is of great importance in the layout and appearance of the motor hotel. Reports show that a few motor courts have recently developed playgrounds and others have built swimming pools.

Automobile accommodations: Most of the tourist hotels provide free space in their own garages, and maintain servicing facilities. However, some managements provide no services beyond free parking space in open-air areas either right outside the rooms or in open-front sheds.

HOTEL-ROOM SPACE REQUIREMENTS: 1—TRANSIENT HOTELS

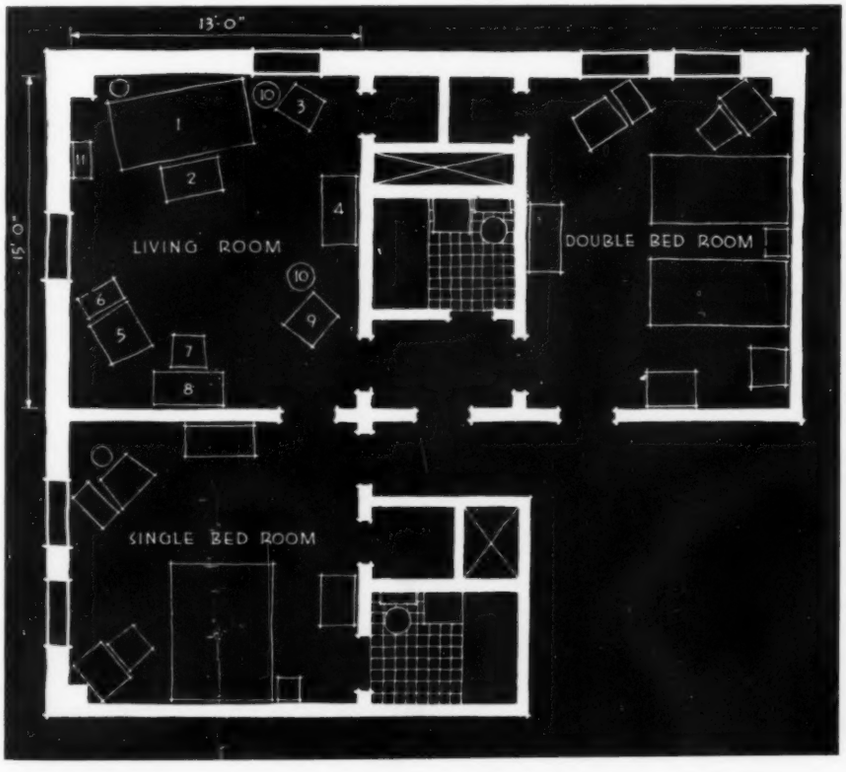
PLANS on this and the following pages are typical, and dimensions fall within the range of room sizes shown in the tabulation below. They are taken from existing hotels, and in some cases are modified to satisfy requirements noted in the previous article. Rooms ordinarily have to accommodate the furniture shown; changes in furniture arrangement may permit larger or smaller room areas without sacrifice of comfort. Determination of exact sizes also depends in part on local code requirements, expected type of patronage, and similar factors. For these reasons, furniture arrangements shown herein are not to be regarded as arbitrary, or as suitable for all conditions. Data were collected and arranged by Molly N. Sipos principally from such sources as *Hotel Management* magazine.



SMALL SINGLE ROOM. Planned to afford identical closet and basin space for adjacent room. Air-conditioning supply branch for pair of rooms may run over closets. **Furniture:** (1) 3-ft bed; (2) night stand; (3) basin; (4) luggage rack; (5) combination desk-chest; (6) chair; (7) table; (8) easy chair.

LARGE SINGLE or SMALL DOUBLE ROOM. Furniture: (1) double bed; (2) desk; (3) chair; (4) table; (5) easy chair; (6) chest; (7) luggage rack; (8) night stand. **Closet:** 3'x4' 6".

TYPICAL DOUBLE ROOM. Furniture: (1) twin beds; (2) chest; (3) desk; (4) chair; (5, 6) easy chairs; (7) night stand; (8) luggage rack; (9) table. **Closet:** 3 ft. by 4 ft. 6 in.



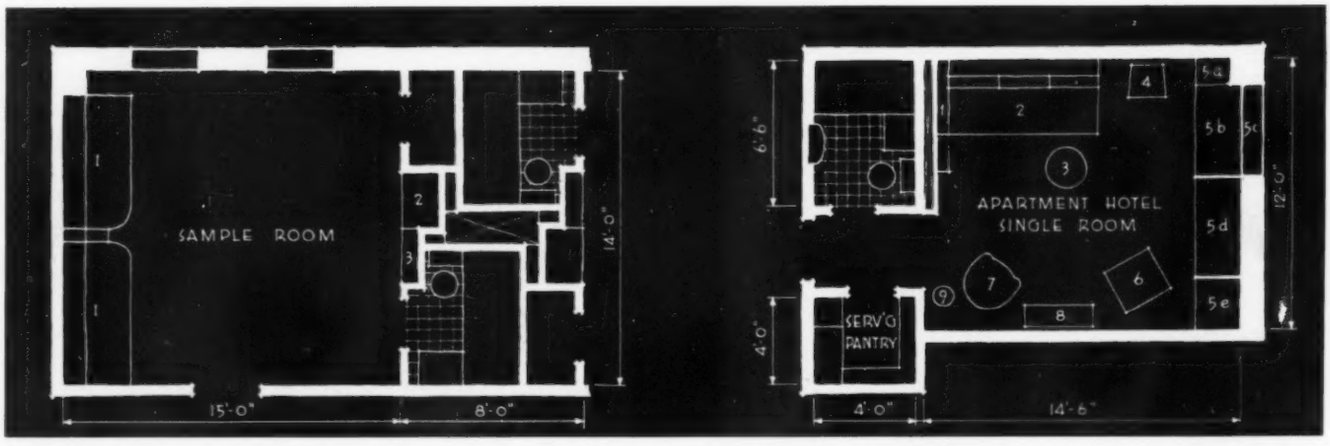
TYPICAL SUITE. Usually located in corner, and arranged so sitting room can connect with either or both bedrooms as 2-room or 3-room combination. Bedrooms same as above. **Living-room furniture:** (1) sofa; (2, 6, 10) tables; (3, 5, 9) easy chairs; (4) chest; (8) cabinet and desk; (11) radio.

APPROXIMATE ROOM SIZES

Rooms	Square Feet Minimum	Maximum
Single bedrooms	80	120
Double bedrooms	120	240
Twin bedrooms	160	260
Sample rooms	210	360
Parlors	160	260
Suite combination rooms:		
Living rooms	160	260
Double bedrooms	120	240
Twin bedrooms	160	260
Baths and closets*		
Bathroom—tub, with shower	28	37
Bathroom—tub, separate shower	40	45
Bathroom—shower only	20	35
Recess for basin	3	6
Dressing rooms	30	40
Wardrobe closets	3¾	20
Closets for folding built-in beds:		
Double bed: (1'9" x 7' min.—2'6" x 7'6" max.)	12¼	18¾
Individual twin bed: (1'6" x 4' min.—2'6" x 5'6" max.)	6	13¾
1 pr. twin beds: (1'9" x 7'6" min.—2'6" x 9'6" max.)	13⅓	23¾
Guest-room floor corridors:	Width—6' min. — 8' max.	
	Height—7½' min. — 9' max.	
Guest-room ceiling height:	8½' min. — 10' max.	

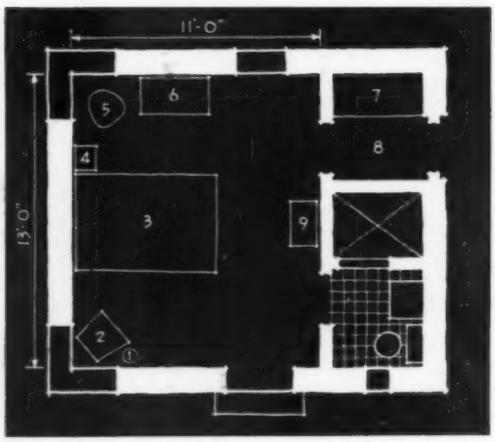
* Bath and closet areas are additional to room areas. These averages have been taken from sizes of modern transient hotels in actual operation. Resort- and apartment-hotel sizes are slightly larger. Air-conditioning supply ducts may run along corridor ceilings.

HOTEL ROOM REQUIREMENTS: 2—SAMPLE ROOM, APARTMENT, TOURIST COURT



SAMPLE ROOM: The average sample room is used in transient hotels and contains a minimum of furniture, since the principal requirement is ample open floor space. Most sample rooms are wasteful of space, and the number incorporated in new hotels is being decreased year by year. In the example given, built-in furniture is used in order to reduce the total floor area needed. Average free floor area required is 210 sq. ft.; if the usual closet-bed, entrance foyer, clothes closet, etc., are installed, total floor area becomes approximately 315 sq. ft. With built-in furniture, this can be reduced to 266 sq. ft. **Furniture:** (1) studio beds with sample rack over; (2) built-in chest; (3) built-in desk.

APARTMENT HOTEL ROOM: Example shown is typical single or small double room for average use; club hotel rooms may be smaller, without pantries. Use of built-in furniture, even to fitted closets, may result in substantial space savings. **Furniture:** (1) end table; (2) studio bed; (3) cocktail table; (4) desk chair; (5a) bookcase to ceiling; (5b) desk; (5c) window; (5d) wardrobe compartment; (5e) drawer section; (6, 7) easy chairs; (8) game table; (9) floor lamp. **Serving pantry:** May contain one-burner hotplate, usually has small refrigerator, storage space. **Bath:** In this, and in many other types of hotels, the standard "hotel" tub, 4 ft. 6 in. long, is often used.



TOURIST COURT rooms are subject to great variation. Example shown (Norman Courts, Norman, Okla.) is half of a two-room unit; more than three rooms are not ordinarily put en suite. Corner windows are here employed to increase available wall space and reduce the possibility of direct vision into adjacent units. **Furniture, etc.:** (1) Floor lamp; (2) easy chair; (3) Double (or twin) bed; (4) night stand; (5) side chair; (6) combination desk-chest; (7) closet; (8) hall to other room; (9) luggage rack. **Bath** has shower stall only; tub is omitted.

DISTRIBUTION OF GUEST ROOMS IN TRANSIENT HOTELS

(Taken from modern hotels in actual operation)

Total of Rooms in Hotel:	75	190	310	500	600	702	1000
SINGLE BEDROOMS:							
Basin	8	—	—	—	—	—	—
Shower	4	—	—	25	—	—	—
Tub with shower	4	—	—	75	—	30	116
DOUBLE BEDROOMS:							
Basin	4	—	—	—	—	—	—
Shower	—	20	62	—	—	—	—
Tub-shower	23	20	69	125	—	300	335
TWIN BEDROOMS:							
Shower	—	—	43	—	—	—	—
Tub-shower	24	50	121	200	120	390	403
Dressing room, tub-shower	—	—	—	—	24	—	—
SAMPLE ROOMS:							
Double bed, tub-shower	—	—	—	—	16	—	4
Bed-in-closet, tub-shower	—	—	2a	15a	—	—	—
NUMBER OF SUITE COMBINATIONS:	4	10, 10, 20	—	30	8, 8, 4	32, 2c	22, 46, 2
Composition of suites:							
Living room—tub & shower	1a	1a 1a —	9	1a	1a — 1a	1a 1	— — —
Double bedroom—tub & shower	—	— 1 1	—	—	— — —	— 1	— 1 —
Double bedroom—shower	—	1 — —	—	—	— — —	— —	— — —
Twin bedroom—tub & shower	1	1 1 1	—	1	4 2 2	1 2b	1 1 3
Living room without bath	—	— — —	—	—	— — —	— —	1 — —
PARLORS (Living-bedrooms):							
Double bed, shower	—	—	1a				
Double bed, tub-shower	—	—	1a				
Twin beds, tub-shower	—	—	1a				

a—Bed built in closet. b—Separate shower stall. c—Deluxe suite.

(All above suite combinations, except deluxe suites and those with living rooms which have no baths, can be converted into individual rooms by closing connecting doors, if required.)

Charles Old

URBAN HOTEL SATISFIES MODERN REQUIREMENTS

St. Thomas

The HOTEL WADE HAMPTON in Columbia, South Carolina, designed by HOLABIRD and ROOT, Architects, presents a solution to what appear to be common problems in many small cities.

IN THE WADE HAMPTON, public spaces are reduced to a minimum without sacrificing comfort, and simple materials are economically used to full advantage. In addition, modern technical advances are included; for instance, the building is entirely air-conditioned.

Basement, first and second floors contain all public rooms and services. The central shaft contains 190 air-conditioned guest rooms in 10 floors, each floor designed to be cared for by a single maid. Vertical circulation is centered in the shaft. This device makes "outside" rooms of all bedrooms.

Photos by St. Thomas

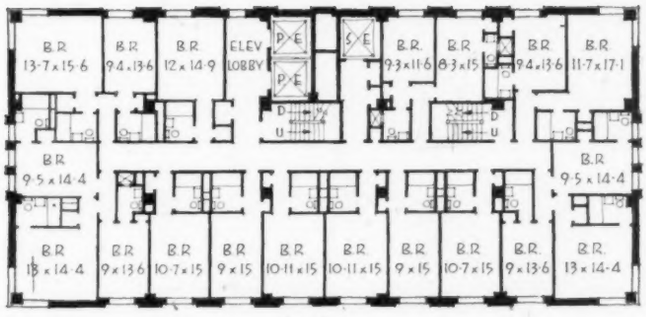
THE TRADITIONAL hotel conception of a multiplicity of dining rooms has been scrapped. The hotel is not large enough, nor is local demand great enough, to support an expensive menu. The Wade Hampton contains only a single coffee shop.

Rooms are somewhat smaller than average. Single rooms on typical floors are 10 by 15 ft. and 9½ by 15 ft. in size. Corner rooms are 12 or 15 by 17 ft. and 14 by 19 ft. These sizes are made possible by the unusual design of typical furniture. Approximately half the rooms are equipped with a combination dresser-desk which is built into the bed; the ensemble is mounted on rollers. On the dresser-desk is a swinging light which serves both bed and desk. This unit, plus two chairs and a luggage rack, is all the furniture needed—a fact which enables room sizes to be reduced without sacrificing comfort.

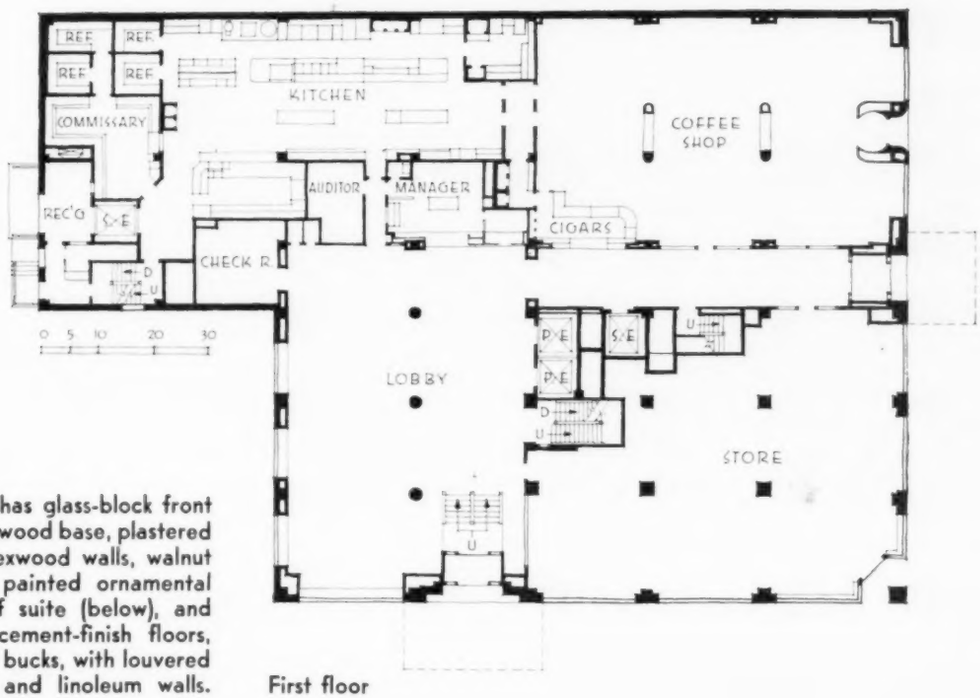
Construction is of reinforced concrete frame on spread footings, with exterior walls of a local oversized brick, Indiana limestone, and Winnsboro granite. The building has stoker-fired high-pressure boilers which supply heat for the forced warm-air winter heating, which uses the same ducts as are required for the summer air-conditioning system. Cooling tower and recirculating fans are in the penthouse.

HOTEL WADE HAMPTON

HOLABIRD and ROOT, Architects



Typical room floor



First floor

Coffee shop, shown above at left, has glass-block front from floor to ceiling, linoleum floor, wood base, plastered walls. Lobby, at left below, has flexwood walls, walnut cases and office equipment, and painted ornamental metalwork. Typical living room of suite (below), and typical single room (right) have cement-finish floors, carpeted, flush panel doors in metal bucks, with louvered transoms. Baths have tile floors and linoleum walls.

Photos by Charles Old

Leonard Frank

HOTEL SERVES URBAN TERMINAL

The HOTEL VANCOUVER, in Vancouver, B. C., is the newest large unit of the chain operated for the Canadian National and Canadian Pacific Railway Companies. The building was commenced in 1928 and the exterior finished from original plans by JOHN S. ARCHIBALD, Architect. Work was then held up until 1938, when immediate completion was undertaken. Since Mr. Archibald's death in 1933, JOHN SCHOFIELD, Chief Architect, C.N.R., has been responsible for the building. Most of the original traditional interior design has been replaced with more modern treatment. Incorporated in the hotel are many mechanical innovations not at first contemplated; and some alterations have been made in room functions.

THE HOTEL VANCOUVER contains some 600 bedrooms and suites, including 60 sample rooms on 12 bedroom floors. Future additions may accommodate as many as 400 more bedrooms. All public rooms are mechanically ventilated and some are air-conditioned. Introduction of the air-conditioning system into a structure not originally designed for it necessitated ingenious planning and engineering.

A public-address system serves all areas, and radio reception is provided in all bedrooms. A special antenna system was designed to give good reception in the bedroom radios, as in a building of this construction with a copper roof, steel frame, and metal lath, the guest rooms are almost completely shielded from radio waves coming from any outside transmitter, while exposed to all manner of interference from electrical equipment within the building.

General construction is steel frame. To provide clear spaces for the large public rooms on the ground floor, large trusses were constructed to carry the 18 floors above.

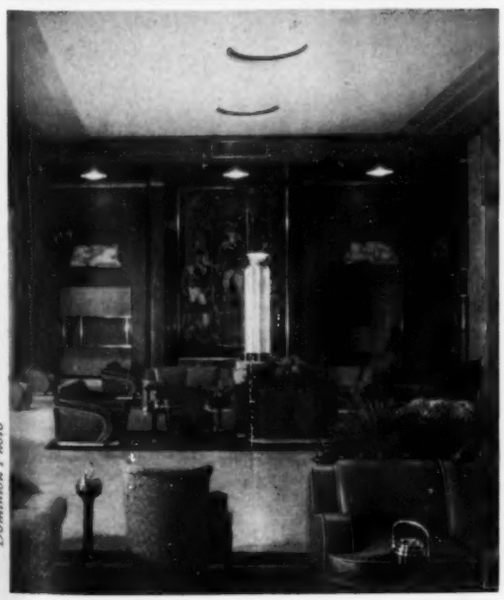
A pneumatic-tube system links the housekeeper and all bedroom floors and the main office, and another runs from the main office to all other departments, dining rooms, etc. All hot- and cold-water piping throughout the building is brass.

The building's exterior necessarily followed a tradition of style already well established in Canadian railway-hotel architecture. It is built of Haddington Island Stone from British Columbia, on three sides, and a local buff brick on the rear.

Dominion Photo

2

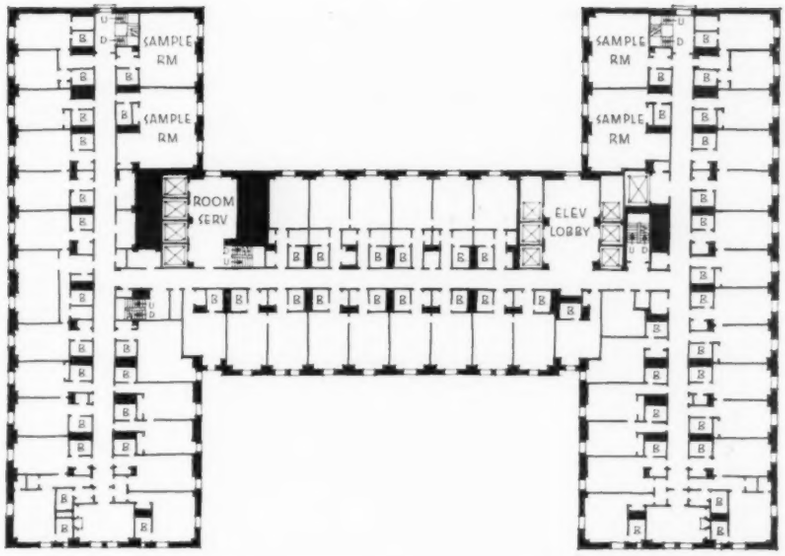
3



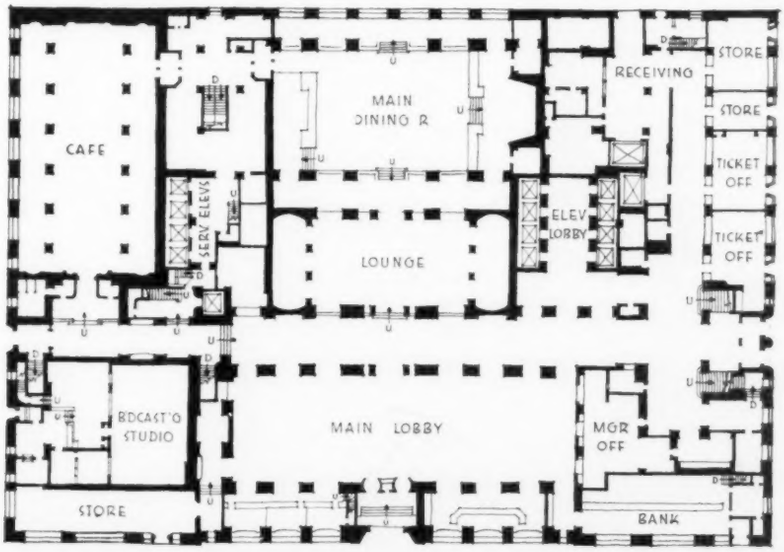
4

Dominion Photo

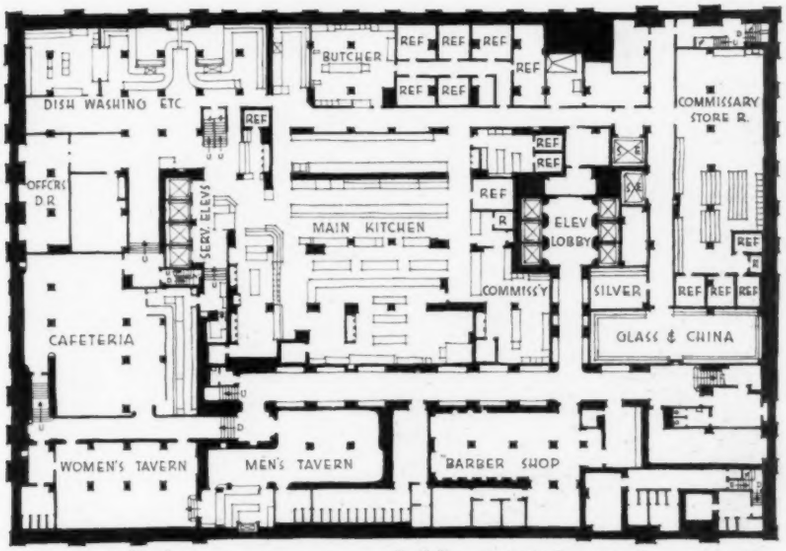
1: Lobby interior, looking toward desk. 2: Main-floor elevator lobby. 3: Reception room is adjacent to ballroom on floor above lobby. 4: Lobby contains mural painted by Charles Comfort, and has English rift-sawn oak panels.



Typical floor: vertical communication is at intersections of wings.



Ground floor: broadcasting studio is in what was an exhibit room.



Basement: kitchens cover an acre. Building is 260 by 187 ft. at grade.

Café on ground floor has tiger-wood paneling, with marble-faced columns, and murals in Venetian red, painted over a gold-leaf base.

Men's Tavern, in basement, is finished in English brown oak and zebrawood. Separate bars are required for men and for women.

Leonard Frank

Typical bedroom is larger than is customary for newer transient hotels in the United States.

RESORT HOTEL MAKES SHORT SEASON PAY

The LAUDERDALE BEACH HOTEL, in Fort Lauderdale, Fla., has proved successful in design and operation, and has been enlarged by the addition of a south wing. The building was designed by the architectural firm of ROY F. FRANCE, Inc.

Burnell

THE ORIGINAL hotel was a three-story L-shaped structure with 63 guest rooms, lobby, lounge, dining room, kitchen, and cocktail lounge. The building as enlarged contains 148 guest rooms and a six-room owner's penthouse. The new south wing is of fireproof construction, five stories high, with 18 guest rooms per floor. Considerable space on the first and second floors of the west wing is allotted to dormitory rooms for employees. However, this has proved insufficient, and a new building is being built to provide additional employee space and garages. A few cottages are available for guests.

Guest-room areas range from 184 to 280 sq. ft. All rooms have private bath with tub-shower combination and built-in medicine cabinet. Tile floors and wainscot are used in all bathrooms. Typical closets are 7 ft. long and accommodate open wardrobe trunks. The main dining room has a total seating capacity of about 325. An adjoining open terrace, with a seating capacity of 60, is devoted to bathers and others who wish to dine in sports attire.

Left, patio is completely surrounded by the hotel; sun lounge and sun deck at far left, dining porch at one side. Right, dining room

Photos by Verne O. Williams

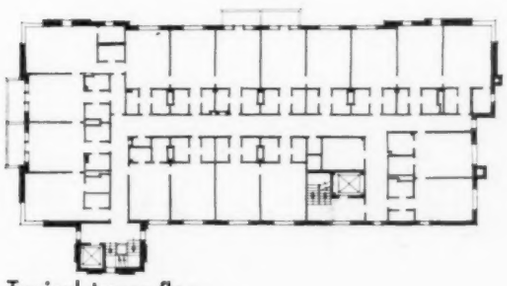
Sun lounge, or promenade, is a typical resort-hotel requirement. Here it serves to connect the two wings of the structure.

Living room of a typical suite

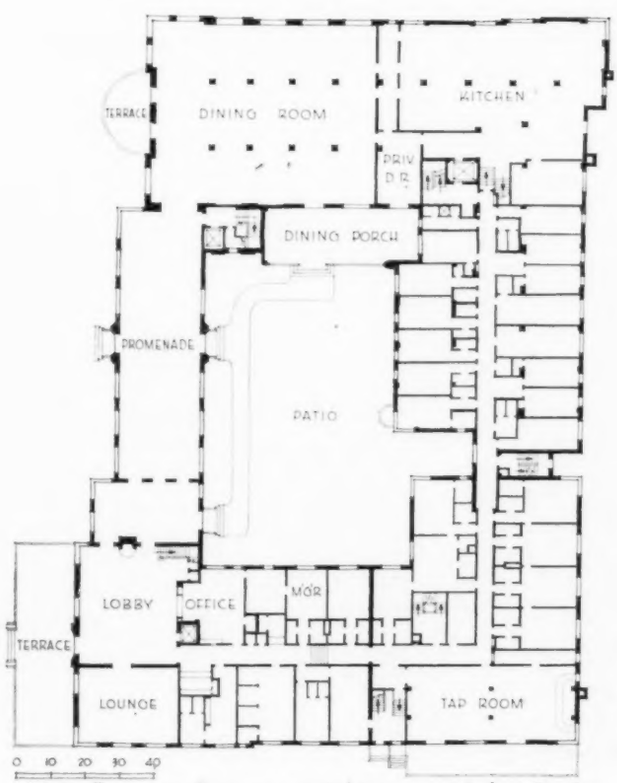
Typical guest room is comfortably large.

LAUDERDALE BEACH HOTEL

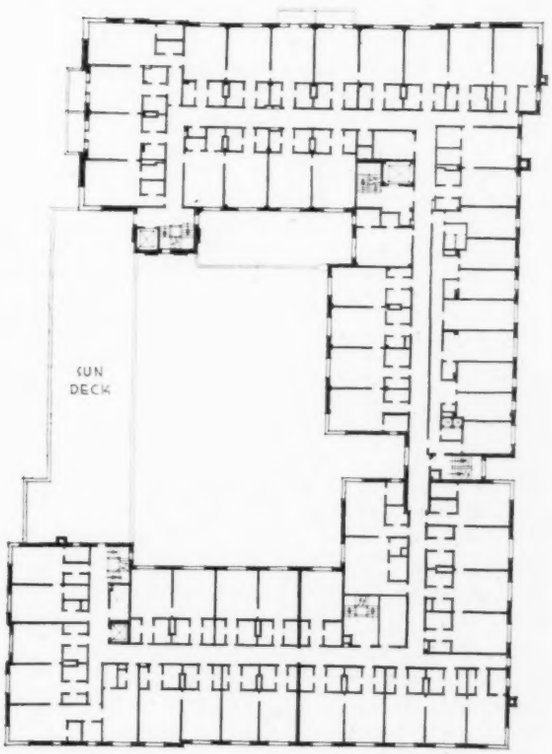
ROY F. FRANCE, Inc., Architects



Typical tower floor



Main floor; small rooms at right, servants' dormitories



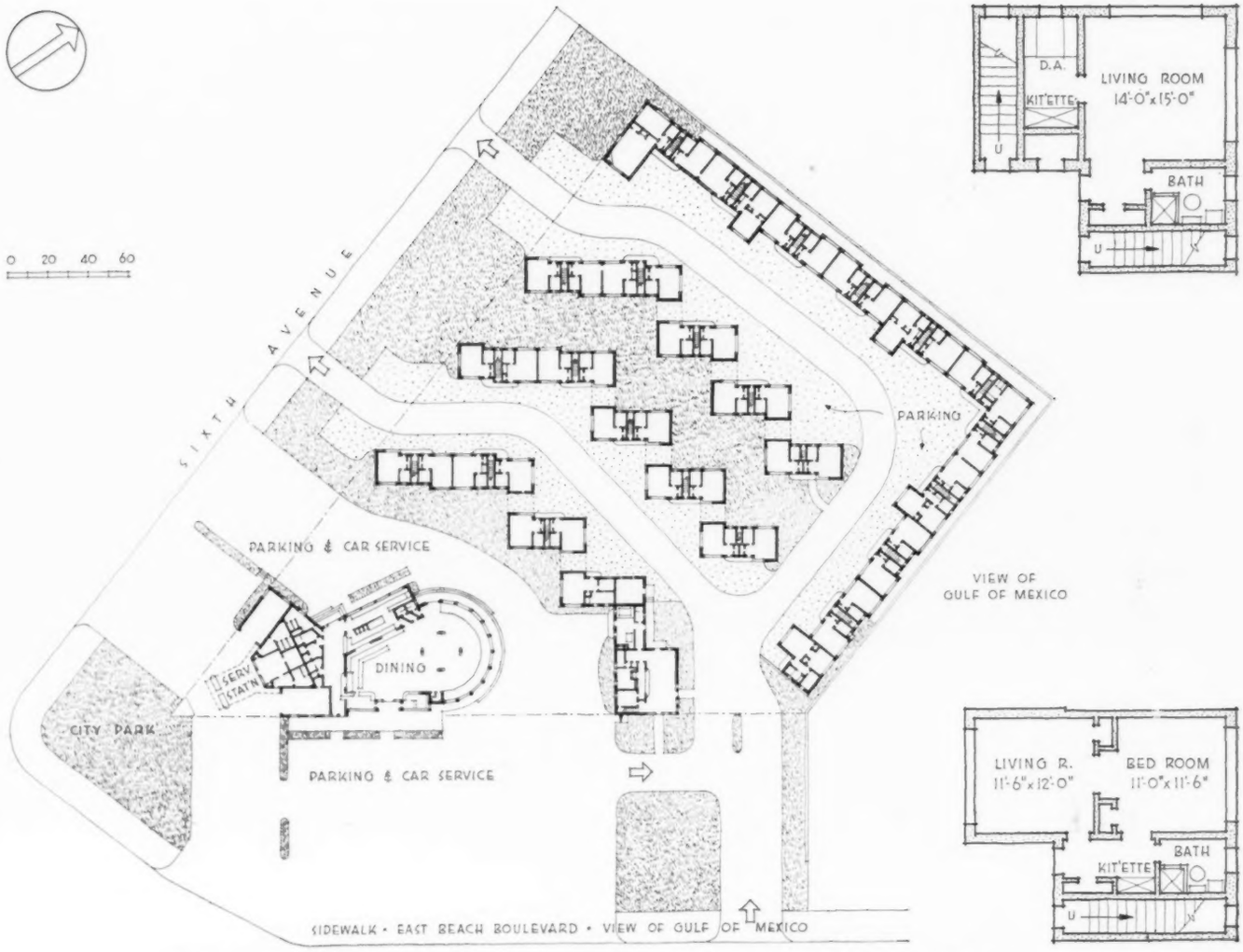
Second floor

AUTO COURT IS PLANNED FOR PRIVACY

JACK TAR COURT, located between two boulevards on the beach at Galveston, Tex., was designed by JOHN J. CROFT, JR., and H. S. SHANNON, Associated Architects. All apartments have at least bedroom and bath; some have kitchenettes; a few, living rooms.

TOURIST ACCOMMODATIONS are contained in one- and two-story buildings which are placed to afford occupants views of the Gulf of Mexico, to take advantage of prevailing winds, and to maintain maximum privacy for each room. Fenestration is planned to enhance privacy. Baths are located so returning bathers do not cross carpeted floors. There are 57 bedrooms with baths, 18 bedroom-bath-kitchenette combinations (of which 6 have dining alcoves), and 9 two-room suites with baths and kitchens. The project includes auto service station, curb-service restaurant, and office with manager's apartment. The low site was filled with compacted beach sand. on which were placed reinforced concrete slabs supported on integral curtain walls. Walls are second-hand brick and asbestos siding. Individual gas heaters are provided for each guest room.

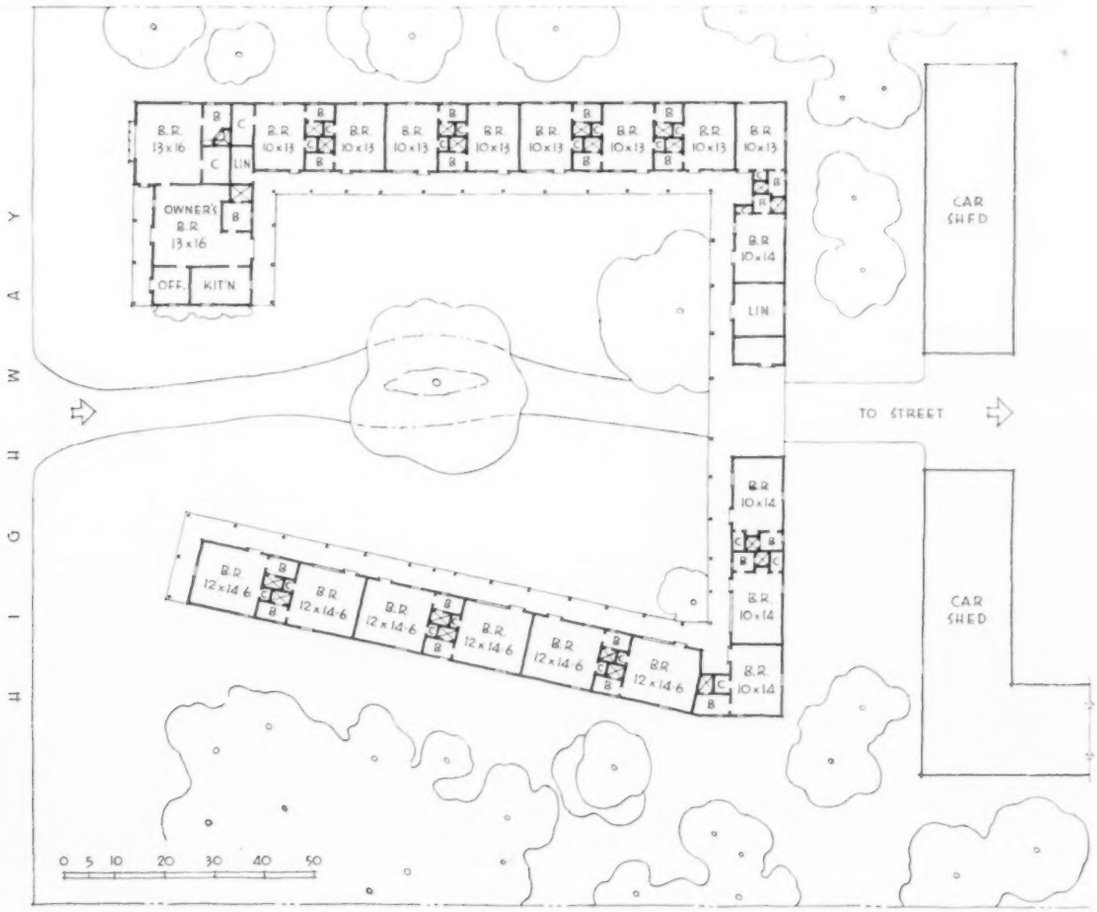
Restaurant's shape (see plan) and decoration are suggestive of a ship's deck.



Restaurant and service station, in same building, operate independently. Office unit controls entrance, contains manager's apartment and boiler room. Typical one- and two-room apartments are shown at right.

Left, office; center, a typical bedroom with combination desk-dresser; right, a typical kitchenette apartment

ATTRACTIVE SETTING HELPS TOURIST COURT SET INCOME RECORD



The RANCHERIA MOTEL near Santa Barbara, California, was designed to attract better-than-average guests at $1.50 to $2.50 per night. On opening night, from $4.50 to $6.00 was charged; these rates have prevailed since. CLIFF MAY was the designer.

THE RANCHERIA MOTEL was built on a sloping site approximately 150 to 600 ft. on U. S. Highway 101 in Montecito, Santa Barbara.

The structure is built on several levels. Arriving cars discharge guests in the central patio, and are driven through the building to garages immediately in back. From the garage court there is direct access to a rear street.

Adjustment of the building to the site, and the manner in which the landscaping takes advantage of local conditions, have aided in achieving an atmosphere which adds materially to the Motel's chances for commercial success. In a district where there are many exclusive resort hotels, the Rancheria can compete seriously for resort clientele.

All hotel accommodations consist of rooms with baths. Kitchens were abandoned from the beginning when investigation revealed that, locally at least, kitchen facilities brought in no additional revenue and created losses in china, silverware, and extra service.

Buildings are of stucco and redwood boards and battens over 2 by 4 in. studs. Roof is of cedar shingles. Interiors are plastered over plasterboard. Baths have showers, but not tubs. There are gas outlets for individual gas heaters.

Cost of the Motel was approximately $1,000 per room with bath, including garage. Furnishings (carpeted floors, average-quality hotel furniture) cost approximately $275 per room.

In a recent Santa Barbara Community Association competition, the Rancheria Motel won honorable mention in the commercial-building class.

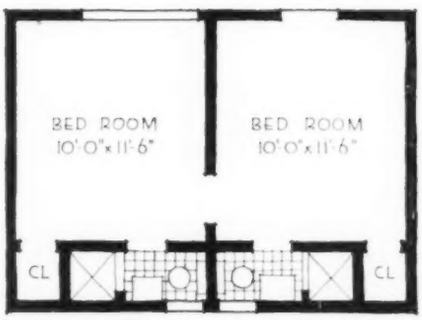
RANCHERIA MOTEL

CLIFF MAY, Designer

Another view from the patio, showing how building follows the site's contours

Office commands the entrance, contains manager's apartment.

Typical interior, showing room with double bed. Some have twin beds.



In some cases, pairs of rooms can be opened up en suite.

Typical room-and-bath unit

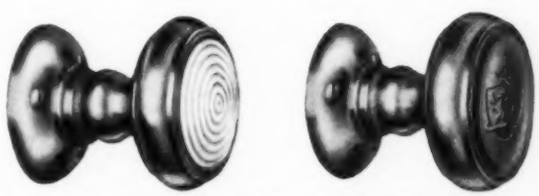
Corridor Lock No. 5170. Functions: Latch bolt by knob from inside only and by guest, master, grand master, display and emergency keys outside. Outside knob is always rigid. Dead bolt by turn knob inside and by all display and emergency keys outside. When thrown by turn knob or display and emergency keys all other keys are inoperative. Can be furnished with button indicator when specified. No. 5171 is similar but with stops in face instead of the key operated stopwork.

Let's Examine Corridor Locks!

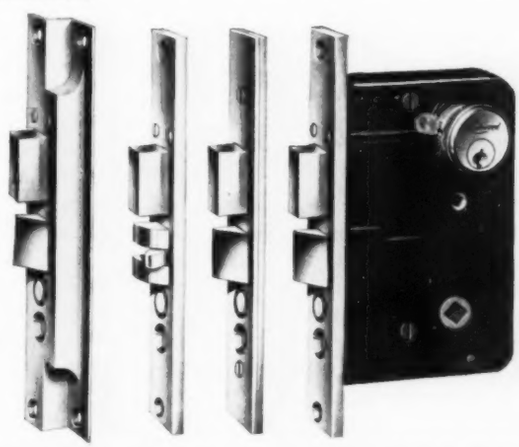
For corridor doors in Hotels and Apartment Hotels, Lockwood offers you No. 5170, in the Lockwood Modernized Line of Cylinder Locks. It is built to dimensions adopted as standard by the Hollow Metal Mfrs. Association. Like all other locks in the series, it is interchangeable in the same mortise with other locks in its series.

Several features make this lock especially suited to hotel service. It has the famous Lockwood Equipoise Knob action—balanced for easy operation in either direction. The range of functions is wide, with accurate and proper keying. It is a sturdy lock, built by Lockwood for the heavy duty that this type of service imposes.

More than 300 different Cylinder Mortise Locks are illustrated in the easy-to-read panorama style in the new Lockwood Catalog. You can save literally hours of time in your cylinder lock specifications by using it. It is free, of course — write for your copy and full information.



Lockwood suggests the Polyflex **FORGED BRASS** Knobs, with standard metal or plastic tops or with specially designed monogram or insignia tops. Polyflex knobs are supplied with Dardelet Set Screws, to assure permanently tight, non-rattling attachment.



Plain cast front, plain latch bolt regularly furnished. Rabbeted front, anti-friction latch bolt, armored front—all are available when so ordered.

LOCKWOOD
L

Lockwood Hardware Mfg. Co.

Division of Independent Lock Co. Fitchburg, Massachusetts

This coffee shop, in Hotel Pennsylvania, New York City, has a noise-quieting ceiling of Armstrong's Ivory Corkoustic. Corkoustic keeps the clatter of dishes and hum of voices under control. The sleek, modern floor is Armstrong's Linoleum. Designer: Raymond Loewy.

Hotels

(Dining-rooms · Restaurants · Lobbies)

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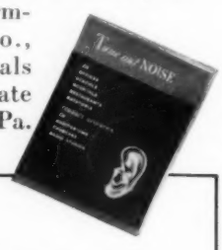
WHEN you build quiet into the hotels you design, you build profits for the men who gave you the commission. Ceilings of Armstrong's Corkoustic maintain the quiet dignity which is so essential to a hotel lobby, and the quiet comfort which attracts customers to a dining-room.

This modern ceiling material has a top sound absorption coefficient of 82% at 512 cycles. Made of cork, it doesn't tend to absorb dust and dirt. It can be washed, vacuum-cleaned, and repainted without impairing its noise-reducing value.

Furthermore, a ceiling of Armstrong's Corkoustic helps to insulate a room—which means lower fuel costs for the management. Its variety of attractive, factory-applied pastel colors are highly efficient in reflecting light, thereby helping to provide adequate illumination at minimum cost.

The extra advantages of Corkoustic are important to every architect and hotel man. To present the facts on effective sound-control, we offer you a file-sized, illustrated booklet "Tune Out Noise." Write for your copy, today, to Armstrong Cork Co., Building Materials Division, 1245 State St., Lancaster, Pa.



Armstrong's

ACOUSTICAL MATERIALS

CORKOUSTIC **TEMCOUSTIC**

Mortgage Money Plentiful

(continued from page 82)

makes for a more healthy economic condition. Today, despite the low lending rates resulting from Governmental policies, established private lending agencies hold overflowing funds and stand ready to finance any volume of building.

According to Mr. Hogan, however, demand is insufficient to absorb anything like the total of available money. Indeed, while the ratio of Government insurance for mortgages has risen to considerable heights, demand for private funds decreased.

Following the FHA example, the HOLC recently reduced its interest rates upon mortgages aggregating $2,400,000,000. The cut was ½% to 4½%. At the same time Congress passed a measure extending the amortization period for HOLC loans from 15 to 25 years, these two events marking the end of long agitation within and without Congress to obtain lower rates for HOLC borrowers.

The bankers are "cognizant of the increase in property values resulting from a combination of long term and low interest rate in a mortgage. Concededly, lower interest rates will reduce carrying charges and thereby increase property values. Hence, loss in mortgage income is partially compensated by increased security value." However, it is the estimation of the private lending agencies that "the process of meeting demands for lower interest rates must be divided along sound and conservative lines, and with regard for the maintenance of investment values."

FIELD TESTS PROVE INSULATION VALUE

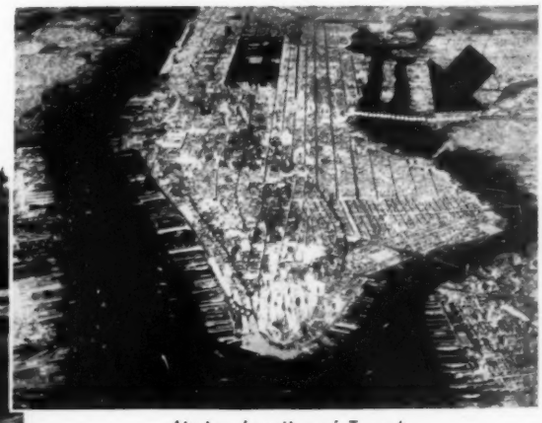
Research on TVA houses shows reduced heat loss, financial gain

EVER SINCE its inauguration, the Tennessee Valley Authority has been conducting a study of small-house planning as a desirable adjunct to the building of over a thousand homes for employees at various dam-construction projects.

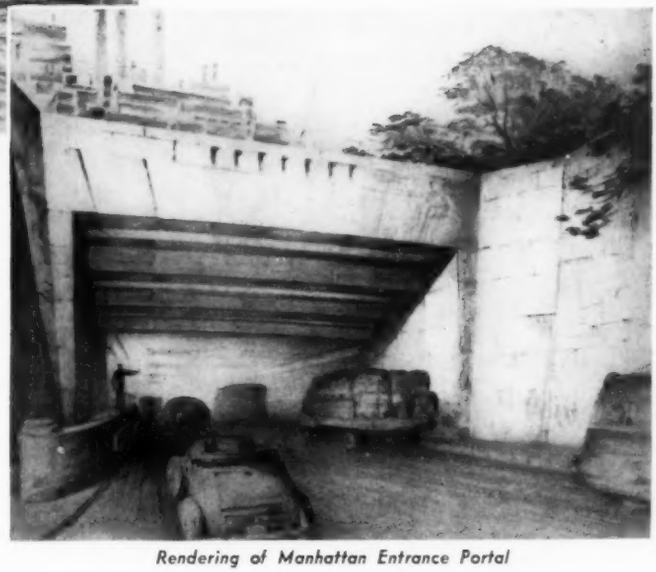
One phase of this research, a three-year study of the economic factors

(continued on page 110)

THE $58,000,000
QUEENS-MIDTOWN TUNNEL



Airview Location of Tunnel



Rendering of Manhattan Entrance Portal

• Four years ago, a pencil line. Today — the PWA financed Queens-Midtown Tunnel — the Underground Express Highway from mid-Manhattan to Long Island, is 94% complete and will open this Fall. From midtown New York, twin double-lane roadways will speed motor traffic under the East River to Queens in 3 minutes, relieving the present bridge congestion and linking fast-growing Queens and Long Island closer to the heart of Manhattan.

When architects and engineers start to work on such a herculean task, no ordinary pencil can be trusted. The intricate plans, blueprints and renderings of the work must be letter-perfect. No scratching, no breaking, just the right tone of black for each detail — heavy responsibilities to fall on a pencil. Little wonder, then, that Venus Drawing Pencils are bought by more architects and engineers than any other pencil in the world. Made by the exclusive colloidal* process, their leads are strong, smooth-flowing, opaque, and guaranteed uniform in their 17 gradations from coal black to dawn gray.

*U. S. Pat. No. 1,738,888

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Tests Prove Insulation Value

(Continued from page 108)

governing small-house insulation, was reported to the recent Centennial Meeting of the National Mineral Wool Association by W. H. Purnell, TVA architect.

The two homes chosen for the experiment cost aobut $1,000 each, and were identical in every respect except that only one was insulated. They were used as laboratories while being inhabited so normal conditions would prevail. And for even greater accuracy, electric heaters were installed for the tests because they are practically 100% efficient in producing heat units from easily metered electrical energy.

Working with this equipment, it was discovered that insulation reduced heat loss by 44.75%. Tests showed the $113 spent on insulating the low-cost house saved 2,590 BTU per degree day. In the locale of Hiwassee, N. C., with an approximate 3,800 degree day, the yearly dividend paid by insulation is:

$11.52 for heating with electricity at 4/10c per KWH (TVA rate).

$7.47 for oil heating at 8c per gal.

$3.78 for heating with coal, hand fired at $6 per ton.

On this basis, insulation would pay for itself in 9.8 years with electric heat, 14.4 years with oil heat, and 30 years with coal heat. If the house were amortized for 20 years, it is apparent that, with electric heat, the insulation would not only pay for itself but reduce the heating costs by 23%. Oil heat, likewise, would pay for itself and then reduce heating costs an additional 23%. With coal it is evident that insulation is not economically justified in such a warm climate unless the size and capital cost of the necessary heating equipment is sufficiently reduced by its use.

In colder sections of the country, however, the whole picture changes. Assuming a northern locale with a 6,000-degree-day heating season, the yearly dividend paid by insulation is:

$45.50 for heating with electricity at 1c per KWH.

$13.20 for heating with oil at 8½c per gallon.

$11.93 for heating with coal, hand fired at $12 per ton.

The insulation would pay for itself in 2.5 years with electric heat, 8.6 years with oil heat, and 9.5 years with coal heat. Heating costs with electricity would be reduced by 39%, with oil by 25.5%, and with coal by 23.5%, to say nothing of the improved stratification, warmer walls, and the summer comfort.

IN NEW YORK 55;
IN CHICAGO 34
Hotels Use Spencer Vacuum

In fact, 80% of the leading hotels use the Spencer Central Vacuum Cleaning System.

USERS SAY: "It is quiet and thorough. It is the only way to clean a hotel and it does many things that we could not do any other way."

CARPETS: A manager of a large New York hotel, after keeping records over a period of years, estimates that carpet life is increased 15% to 20% by the Spencer System.

DECORATIONS: Since all dirt and dust go down to a separator in the basement, and the exhaust out of the stack, absolutely no dust is distributed around the hotel. This reduces dusting time and saves on painting and redecorating costs.

FURNITURE: The Spencer System has a special swivel connection which enables the operator to clean under beds, around table legs, etc., easily and quickly. Hand tools are provided for upholstered furniture, special tools for radiators, and the open hose end is used to clean mattresses.

The new Spencer Bulletin shows how it is used, how it is built and how it saves money in hotels. Ask for Bulletin No. 121-R.

Spencer Bulletin No. 121-R shows how the Spencer System is used, how it is built and how it saves.

181-D

SPENCER HARTFORD
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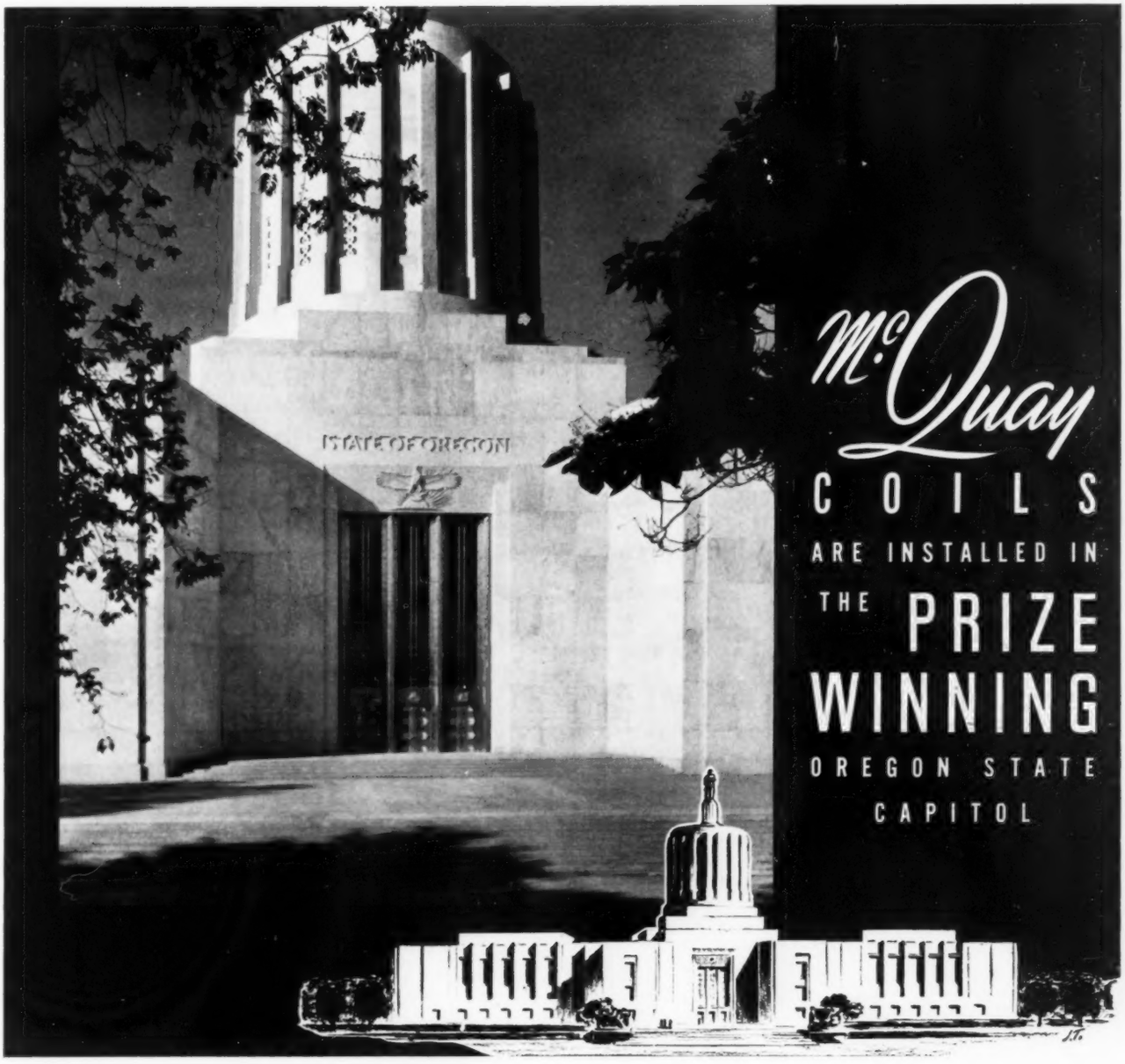
HOUSEWIFE WRITES ON HOUSE PLANNING

STRUCK BY THE potential sociological significance of houses planned for adaptability to their owners' changing economic and social needs, Mrs. Beatrice Anne Chesney, a Berwyn, Ill., housewife (whose avocation is city planning, and whose hobby is architecture), set down her thoughts on the subject. The mainspring for her analysis was a house shown in the RECORD's April issue. Mrs. Chesney writes:

For many years the flexible planning of residences (one very important means of providing an opportunity for normal, wholesome parenthood) has challenged architects and architectural magazines, blind to its possibilities. As a housewife, I have watched my own children and the children of others marry – in the hearts of each one of them an impulse to create a home in which to establish and

(continued on page 112)



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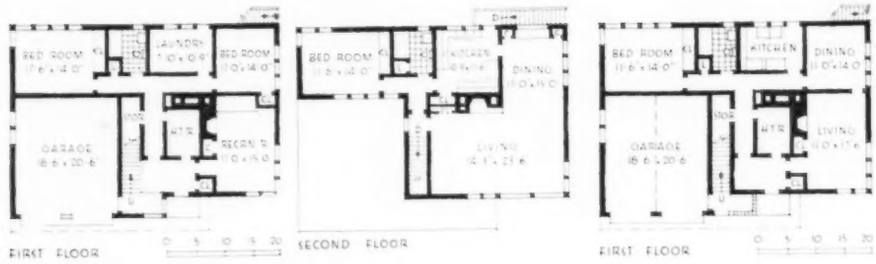
Housewife Writes of House Planning

(continued from page 110)



Left and center, original plans; right, Mrs. Chesney's version of first-floor plan

maintain a family unit. I watched each couple save for that home and put those savings into furniture, a car, and an apartment planned for two. I watched future savings go for high rent, another car, trips to relieve the tedium of cramped quarters, occasionally one child (poor thing). I watched each dream home become gradually, insidiously, permanently, an apartment planned for two plus a bar and the newest in contraceptives.

Now I am watching a new generation and I find the same impulses to create homes—the same need for flexible planning of residences—the same challenge to architects and architectural magazines.

Because of its excellent biotechnic planning, I have chosen the Harlow house by Architects Hamilton Beatty and Allen J. Strang of Madison, Wis. (AR 4/40, pp 62-63) to illustrate my point.

Let us imagine a bride and groom with the same lot and the same plan solution as Prof. and Mrs. Harlow, but economically unable to build their dream home. I would advise the flexible planning pictured at right with:

(a) Second floor (exactly as planned for dream home) to be rented until house is paid for.

(b) First floor and left-hand garage for use of owner (our bride and groom). In this revised plan, note these points:

(1) Glass block for privacy of entrances.

(2) Closets in hall and living room may be omitted to make larger living-room-hall combination (placing a movable wardrobe in hall to take their place).

(3) Kitchen has washing machine and triple-duty sink laundry-tub cabinet (with drainboard-on-wheels) under window.

The combination kitchen-laundry of first floor can easily be converted later into laundry of original plan (or a maid's room or child's bedroom if washing is sent out). By removing one partition (built for ease of removal), one door, and the light partition in garage (I suggest wire mesh), and adding one closet (three, if hall and living room closets are omitted in first plan), we have the original one-family dream home with unlimited possibilities for use.

With living room, dining room, and kitchen on second floor as originally planned, possible arrangements are numerous:

(1) Master bedroom (upstairs or down as preferred), two bedrooms for children, two baths, laundry, and recreation room.

(2) Master bedroom, two bedrooms for girls, two baths, laundry, and boys' dormitory (using recreation room with double-decker beds, leaving space for play on rainy days).

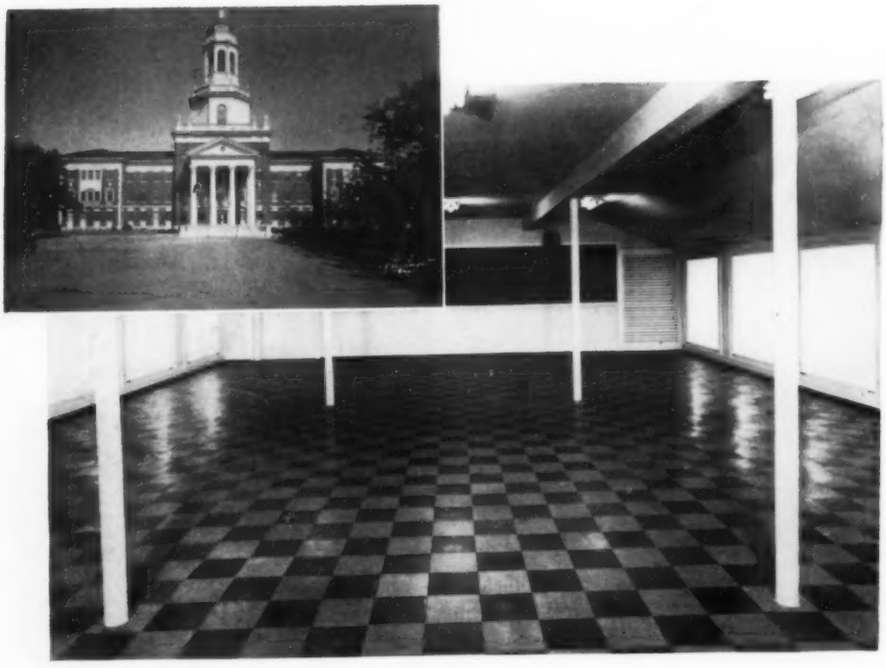
(3) Master bedroom, three bedrooms for children (laundry sent out), two baths, and recreation room.

(4) Guest room (upstairs), master bedroom (below), two baths, two girls' rooms, boys' dormitory (recreation room as in (2), laundry sent out).

(5) Guest room, master bedroom, two baths, laundry, girls' room, boys' dormitory.

(6) Master bedroom (downstairs), girls' room (above), two baths, laundry, maid's room, dormitory for boys (or girls).

(7) In period of transition between two-apartment plan and use of entire house by owner, the downstairs bedroom and bath and left-hand half of garage could be easily shut off from remainder of house and rented as a bachelor apartment.



WHEN architects and engineers plan a school building, they must provide for many different types of flooring. There are corridors and classrooms, library and offices, cafeteria and gym to be considered. Too, in some schools, there are vocational training shops.

Each of these areas needs a floor covering to fit its usage. All must be quiet, comfortable underfoot, attractive, able to stand heavy traffic. Also, and this is important in every school budget, floors must be inexpensive in maintenance.

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